Cambridge District Fisheries Management Plan

1989 - 2000

Ontario

Ministry of
Natural
Resources

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PREFACE

This document consists of fisheries resource information and management strategies which collectively form the Cambridge District Fisheries Management Plan. The purpose of the plan is to describe the long term direction of fisheries management efforts in Cambridge District to the year 2000, and the specific management actions that will be taken in the short term (5 years). The plan will provide guidance to local planners and fisheries managers as well as indicate future fisheries management initiatives to the public.

Copies of a draft version of the plan were circulated to members of the general public and other interested parties in February 1988. Revisions were made to the draft plan to reflect comments and suggestions made during this review. The next opportunity for formal public review of this plan will be in 1993, prior to preparation of an implementation schedule for the second five years (1994 - 1998) of the planning period.

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1.0 INTRODUCTION

1.1 PURPOSE

Cambridge District is one of five administrative districts within the Central Region of the Ontario Ministry of Natural Resources. The district encompasses approximately 700,000 hectares of land area and 36,000 hectares of Lake Ontario, including Hamilton Harbour (Fig. 1). It includes the Regional Municipalities of Hamilton-Wentworth, Waterloo and Halton, Wellington County (except Minto Township), Brant County (except Burford and Oakland Townships), Blenheim Township in Oxford County, and East Luther Township in Dufferin County.

This fisheries management plan has been prepared to outline the direction for fisheries management in Cambridge District to the year 2000. In addition, the plan will identify specific activities required to manage local fisheries resources over the next five years.

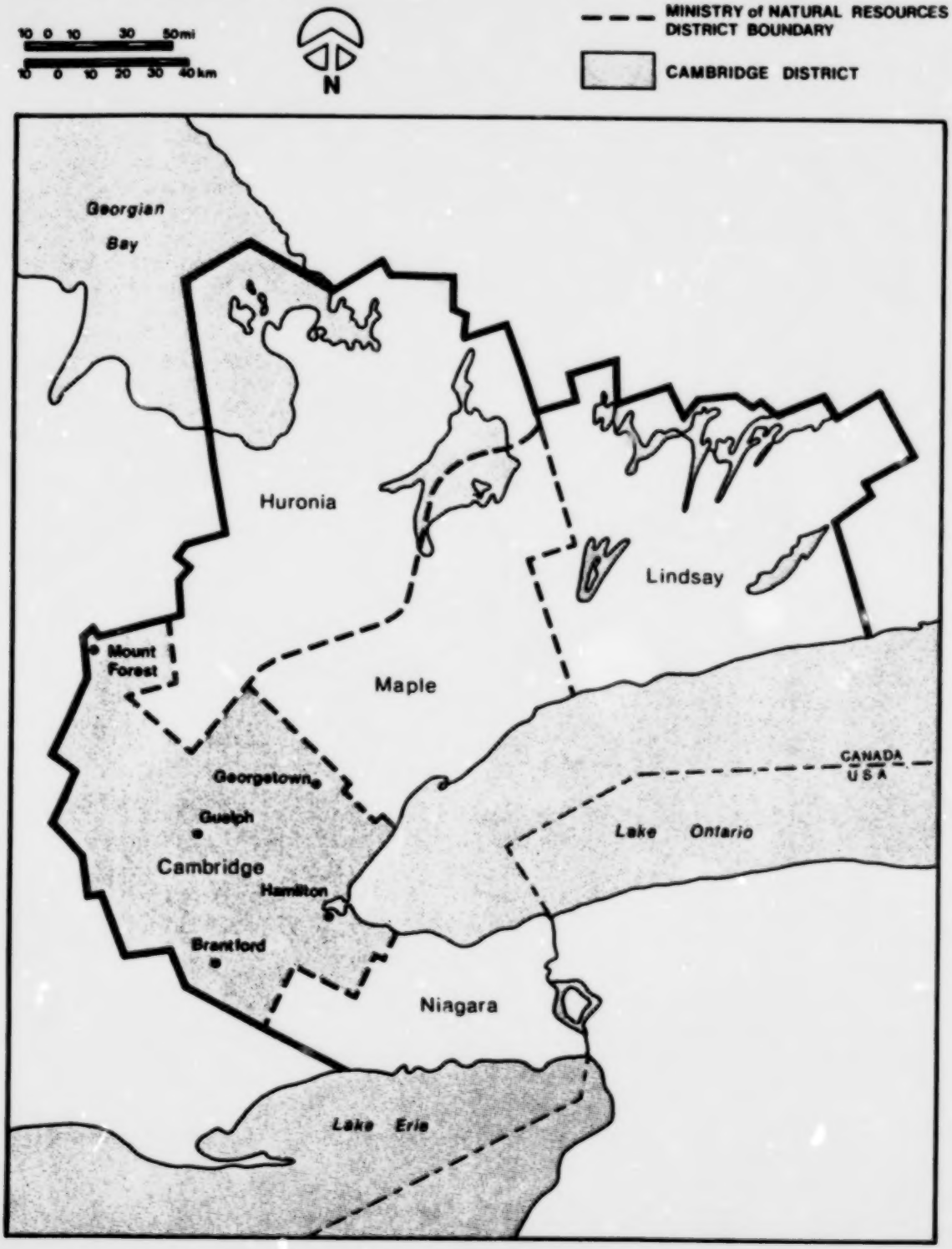
1.2 PLANNING PROCESS

The Cambridge District Fisheries Management Plan has been prepared as part of the Ontario Ministry of Natural Resources' (OMNR) integrated resource managment planning system. The Southern Ontario Coordinated Program Strategy (SOCPS) (OMNR 1982) identifies how OMNR intends to achieve its goals for resource production and outdoor recreation in southern Ontario. District Land Use Guidelines (DLUG) (OMNR 1983) were formulated from the SOCPS in 1983 and define resource management targets OMNR intends to achieve locally through its own efforts and through cooperative efforts with other agencies, municipalities and private landowners. This Fisheries Management Plan falls under the general framework of the DLUG, but defines more detailed management objectives and strategies for achieving fisheries targets.

The original fisheries targets and management direction identified in the DLUG in 1983 were formulated with the best available information. Some of these data were inaccurate and resulted in unrealistic estimates. For example, the sport fishery targets developed from the 1980 Sportfish Angler Survey were generally too high. During the fisheries management planning exercise, new data were used to formulate more realistic and up-to-date targets. With approval of the District Fisheries Management Plans, the DLUG have been amended simultaneously to reflect changes in fisheries targets and management direction.

FIGURE 1
CAMBRIDGE DISTRICT

REGIONAL SETTING



The policy framework, management principles, goals and objectives for fisheries management throughout the province, and built into the SOCPS and DLUG, originate from the Task Force on Strategic Planning for Ontario Fisheries (SPOF) (OMNR 1976). This fisheries management plan is based on principles presented in the SPOF documents. Vital to the planning process is public involvement so that resource users are aware of what is being planned, and have a role in choosing the strategies to be used to achieve fisheries goals and objectives. Two opportunities for public input were provided during the development of the Cambridge District Fisheries Management Plan; the first following circulation of a background information document (Aug 1987) and the second following circulation of a draft version of the plan (Feb 1988). Should this fisheries plan require additional changes over the course of the planning period, an opportunity for futher public input will be provided.

1.3 EXISTING POLICY AND TECHNICAL DIRECTION

This plan adheres to current OMNR policies and is founded on an integrated resource management approach. This approach encourages multiple use, but coordinates various programs to ensure that conflicts are minimized and management programs that benefit several programs are encouraged. An integrated approach to fisheries management is critical since numerous other issues and activities have a direct impact on local fisheries.

A number of background documents were utilized in the development of this fisheries management plan. These documents are available at the Cambridge District office and include:

(i) Terms of Reference (Tilt 1986) - Outlines the fisheries management planning process and provides a detailed table for the completion of each phase.

(ii) Fisheries Background Information (Tilt 1987a) - Provides a detailed synthesis of all background information including problems and issues, fisheries yields, current and projected use, and current fisheries management practices.

(iii) Summary of Background Information and Optional Management Strategies (OMNR 1987a) - A public document summarizing background information, highlighting problems and issues and presenting optional fisheries management strategies.

(iv) Summary of Public Response to Background Information and Optional Strategies (Tilt 1987b) - Summarizes public comments and questionnaire responses to the background information/optional management strategy phase of the planning process.

(v) Cambridge District Draft Fisheries Management Plan (OMNR 1988) - A public document which identifies long term targets, outlines selected management strategies and tactics and presents the first five year implementation schedule.

(vi) Summary of Public Response to the Cambridge District Draft Fisheries Management Plan (Halyk 1988) - Summary of public review and comments on the draft fisheries management plan.

2.0 DISTRICT FISHERIES PERSPECTIVE

2.1 THE FISHERIES RESOURCE

The inland and Lake Ontario waters of Cambridge District support a diverse fisheries resource. Inland fisheries occur in coldwater streams, warmwater/coolwater rivers and streams, lakes and reservoirs. Lake Ontario supports a coldwater salmonid fishery, largely sustained by stocking, and a limited warmwater fishery. Major fisheries resources and related background information are shown on Map 1 (back cover pocket).

The distribution of local fish populations is greatly affected by physiography. The major features are:

- till plains in the northwest of the district and below the Niagara Escarpment
- moraines through the central portion of the district
- the Niagara Escarpment
- sandy lacustrine plains in the Brantford area
- clay lacustrine plains in the southeast
- glacial spillways

The moraines, sandy lacustrine plains and glacial spillways are associated with the higher quality sport fisheries. substantial baitfish resources can also be found in the till plains and clay lacustrine plains.

The following is a brief description of the main components of the fisheries resource in Cambridge District:

Coldwater Streams

There are 37 coldwater streams (total length 315 km) located generally in the moraine and sand plain physiographic regions (Appendix 1, Map 1). These streams are inhabited by native brook trout, as well as introduced populations of resident brown trout. In addition, significant spawning runs of migratory rainbow and brown trout and Pacific salmon from Lake Ontario occur in the lower and mid reaches of Bronte, Oakville, Spencer and Grindstone Creeks. Where migratory salmonids have access to coldwater portions of the above streams, they often reproduce successfully.

Warmwater/Coolwater Rivers and Streams

An estimated 635 km of streams and rivers in the district support productive warmwater and coolwater fisheries (Appendix 2, Map 1). Most fishing activity takes place on the Grand River or its major tributaries (Nith, Conestogo, Speed Rivers).

Sport fish inhabiting warmwater and coolwater rivers include largemouth bass and smallmouth bass, northern pike, walleye, yellow perch and panfish. Carp, white sucker and bullhead are the most common coarse fish. Bluntnose minnows, creek chub, common shiners, blacknose dace and fathead minnows provide forage for sportfish and are harvested commercially to provide bait for anglers. Relatively small spawning migrations of rainbow trout and Pacific salmon from Lake Erie occur in the Grand and Nith Rivers upstream to the Paris and New Hamburg dams respectively.

Inland Lakes and Reservoirs

Twenty lakes and reservoirs over 10 ha in surface area (Appendix 3, Map 1; total area - 2,950 ha) provide warmwater and coolwater angling opportunities. Fish species commonly found include largemouth and smallmouth bass, northern pike, yellow perch, rock bass and black crappie. Small walleye populations are found in two waterbodies (Puslinch Lake and Binbrook Reservoir).

Lake Ontario

Cambridge District encompasses 33,600 hectares of the western basin of Lake Ontario. Also associated with the lake are Hamilton Harbour (2,098 ha) and Cootes Paradise (195 ha). Cootes Paradise provides the only extensive marsh habitat in the Cambridge District portion of Lake Ontario.

The Lake Ontario sport fishery is sustained by extensive stocking programs administered by both Ontario and New York State. Species stocked by the OMNR include rainbow, brown and lake trout, and coho and chinook salmon. In addition, an experimental program has recently been initiated to re-introduce a self sustaining Atlantic salmon population. Salmon stocked in the upper Credit River (Maple District) will utilize portions of Credit River watershed in Cambridge District for migration and possibly rearing purposes.

Although poor water quality limits fish habitat in Hamilton Harbour, Lake Ontario sportfish do utilize the harbour during the spring and fall months. A small resident fish community inhabits Cootes Paradise and to a lesser extent the harbour itself. This resident community is mainly composed of coarse fish and panfish (carp, alewife, brown bullhead) but pike, smallmouth bass, crappie and perch are present in small numbers.

2.2 POTENTIAL YIELD

To determine the capacity of the resource to provide recreation or fish products, it is necessary to calculate potential yield under present and future conditions. Yield estimates identify the weight of fish flesh that is available for harvest in a given waterbody over a given period of time. It should be emphasized that yields are theoretical values, based on the capacity of the resource, as apposed to what is actually being harvested. The Glossary found on page 92 provides a formal definition of potential yield and other technical terms found in this document.

Potential yield for Cambridge District waters (both inland and Lake Ontario) is estimated to be 386,600 kg/yr (Table 1). Projected (year 2000) potential yield in Cambridge District is forecasted to be approximately equal to the current potential yield due to an expected balancing out of production losses due to habitat degradation and production gains due to habitat creation and rehabilitation.

2.3 CURRENT AND PROJECTED RESOURCE USE

Sport Fishermen

An estimated 154,000 angler-days are currently spent fishing in Cambridge District (Table 1). Most of this effort is from Ontario residents local to the area.

TABLE 1: FORMULATION AND TESTING OF FISHERIES TARGETS FOR CAMBRIDGE DISTRICT WATERS

FISHERY	CURRENT USE*		PROJECTED USE*		DLUG TARGETS**		POTENTIAL YIELD*		FINAL TARGET	
	kg/yr	Angler-Days*	kg/yr	Angler-Days*	kg/yr	Angler-Days*	kg/yr	Angler-Days***	kg/yr	Angler-Days*
SPORT FISHERY										
INLAND										
Coldwater Streams	2000	10000	2300	11500	------	------	2300	11500	2300	11500
Warmwater/Coolwater Rivers	34000	68000	39100	78200	------	------	108300	216600	39100	78200
Lakes and Reservoirs	5000	10000	5800	11500	------	------	52000	104000	5800	11500
TOTAL INLAND	41000	88000	47200	101200	------	------	162600	332100	47200	101200
LAKE ONTARIO										
Coldwater Species	129000	61000	148300	70100	------	------	205000	102500	148300	70100
Warmwater/Coolwater Species	2500	5000	2900	5800	------	------	19000	9500	2900	5800
TOTAL LAKE ONTARIO	131500	66000	151200	75900	------	------	224000	112000	151200	75900
TOTAL SPORT FISHERY	172500	154000	198400	177100	247000	988000	386600	144100	198400	177100
BAIT FISHERY										
All Zones	139000 Dozen		160000 Dozen		180000 Dozen		------		139000 Dozen	

* Defined in Glossary
** Original DLUG Targets formed in 1983. They have since been revised.
*** Resource based opportunities calculated using yield standards (kg/angler-day).

Approximately 45% (66,000 angler-days) of the current fishing effort in the district is spent seeking salmonids in Lake Ontario. Inland anglers spend 10,000 angler-days seeking resident trout in coldwater streams, while 78,000 angler-days are spent fishing in warmwater streams, rivers, lakes and reservoirs. Angling activity in stocked trout ponds or fishing preserves has not been included in these figures.

The estimated current harvest by the sport fishery is 172,500 kg/yr. Approximately 76% of this harvest (131,500 kg/yr) is caught in Lake Ontario. Inland coldwater fisheries account for one per cent (2,000 kg/yr) of the current harvest, while inland warmwater fisheries account for 23% (39,000 kg/yr).

By the year 2000, the level of sport fishing activity in Cambridge District is estimated to increase by 15%. This estimate is based on an estimated population increase of about 1% a year. Projected use of the fisheries resource in Cambridge District is therefore expected to reach 177,100 angler-days per year, with an estimated recreational harvest of 198,400 kg/yr (Table 1).

Commercial Food Fishermen

Currently, no commercial fishing occurs for food fish in Cambridge District waters. The initiation of a commercial food fishing industry within district boundaries is not anticipated.

Commercial Bait Fishermen

There are currently 33 harvest licences that are assigned to one or more of the seven baitfish management zones in Cambridge District. The current district policy is not to issue any new baitfish harvest licences until we have more information on the current status of baitfish populations in the district.

The average annual baitfish harvest for the last ten years is estimated to be approximately 139,000 dozen (Table 1). Sixty per cent of the harvest comes from warmwater streams and rivers, 20% from inland lakes and reservoirs and 20% from Lake Ontario.

Projected use of commercially-harvested baitfish is estimated to be 160,000 dozen per year by the year 2000, a 15% increase over current average harvest levels (Table 1). This estimate was made by assuming that the demand for local baitfish will parallel the forcasted increase in angling activity.

Private Fish Farms

There are 21 private fish farming operations in the district, located primarily where groundwater resources exist in sufficient volume to make such operations viable. Five of the above farms are also licenced as private fishing preserves where the public pays a fee to fish.

Interest in fish farming has grown considerably, with several new operations being established in the district in recent years. This trend is expected to continue due to downturns in the conventional farm economy and increased consumer interest in fish for both human consumption and stocking.

Native Fisheries

The Six Nations (No. 40) and New Credit (No. 40A) Reserves are located adjacent to the Grand River in Tuscarora Township (Brant County). Very little is known about historic or present use of the fisheries resource by native people in Cambridge District.

At present, the Six Nations band is undertaking exploratory meetings with the Provincial and Federal governments prior to negotiations to establish a native fishing agreement for the Grand River Watershed.

Fish Viewing

There are no established fish viewing areas in Cambridge District although salmon and trout runs in the Lake Ontario tributaries (Bronte, Oakville, Spencer and Grindstone Creeks) and walleye runs in the Grand River in the Brantford vicinity attract numerous people. An increase in participation by the year 2000 is expected.

2.4 PROBLEMS AND ISSUES

A number of problems and issues affecting local fisheries resources have been identified during earlier stages of the fisheries management planning process. These are described in detail in the background information document. The following is a brief summary:

Loss of Fish Habitat and Environmental Quality

There is a general agreement between fisheries managers and the public that loss of fish habitat and environmental quality is the most serious problem facing management of all Cambridge District fisheries. Public response to the background document showed an equal level of concern for habitat loss in inland waters and contaminant levels in Lake Ontario fish.

This problem is due mainly to agriculture and urbanization. Deforestation, poor farming practices, urban development, dam and pond construction, channelization and draining of wetlands are the main contributing activities.

Demand vs Supply of Angling Opportunities

This issue primarily affects achievement of inland sport fishing targets. Present demand for preferred sportfish species (resident brook and brown trout, largemouth and smallmouth bass, walleye and northern pike) is so high that some of the more popular fishing areas are being overfished. At the same time, other waterbodies of less desirable fish species are underutilized by anglers.

Supply/demand problems in Cambridge District are often compounded by other fisheries issues. Habitat loss and the posting of private land has increased competition for what remains. Traditional angler attitudes result in readily available panfish and coarse fish populations being overlooked in favour of less available gamefish stocks.

Lack of Public Awareness

It is often difficult to understand and appreciate the complicated relationship between a fish population and the components of the environment around it. Very often, short term solutions (e.g. stocking, increased enforcement activity) are proposed to resolve symptoms of long-term problems (e.g. habitat destruction, poor user ethics). Many anglers have greater expectations of sportfish abundance and species diversity than the habitat can possibly support.

Many incidents of fish habitat destruction can be traced to lack of awareness on the part of the individual or group that is responsible for the destructive activity. In most cases, habitat loss can be avoided if those responsible are made aware of the sensitivity of the habitat and mitigation alternatives.

Public response received earlier in the fisheries planning process indicates a general desire for expanded programs to increase awareness of the many factors involved in fisheries management.

Inadequate Scientific and Technical Knowledge

Frequently, managers of the fisheries resource lack the scientific knowledge and resource data to properly assess the condition of fisheries or the extent of their use, and to accurately predict the effects of management actions. This is particularly evident when calculating and allocating fish yields or predicting species interactions within a fish community.

The urgency of solving problems often forces managers to make decisions based on the best available information. Lack of site specific information can result in inadequate protection of significant or sensitive fisheries from development impacts.

Problems Identified through Public Consultation

Additional problems and issues were suggested by members of the public who reviewed the background information documents. In all cases, the specific problem nominated (e.g. pollution, groundwater abstraction, poor angler ethics, lack of access, illegal harvest) could be categorized under one of the four headings outlined above.

Several anglers nominated lack of stocking in inland waters (fishery not specified) as a problem. Lack of suitable family angling opportunities at stocked trout ponds has been a chronic problem due to the high cost of maintaining an artificial fishery. Because of additional revenue generated by the provincial resident angling licence, the district will now be in a better position to address this issue (see page 37).

3.0 MANAGEMENT DIRECTION

3.1 GENERAL FISHERIES MANAGEMENT OBJECTIVES

The goal of the Ministry of Natural Resources is to provide opportunities for continuous economic and social benefits to the people of Ontario through the development and conservation of Ontario's natural resources.

The objective for fisheries management in southern Ontario is to provide opportunities for recreation and economic benefits consistent with the maintenance of healthy fish communities.

Objectives for the management of local fisheries resources are presented in the Cambridge District Land Use Guidelines (DLUG). They are:

- to meet the demand for sport fishing within the limits of a wisely managed and rehabilited resource,
- to maintain current baitfish production, and
- to prevent the extinction of any native fish species.

3.2 SPECIFIC FISHERIES MANAGEMENT OBJECTIVES, TARGETS AND STRATEGIES

A number of specific objectives have been developed for local fisheries. These are consistent with the above Ministry objectives, but reflect public consultation, predicted demands on the resource and the capacity of the local fisheries to meet that demand.

The following is a list of specific objectives for the management of fisheries resources in Cambridge District:

All Fisheries District Wide

(i) Fish Habitat Protection

- to protect fish habitat from degradation by human activities

(ii) **Stewardship and Ethics**

- to foster an attitude of public stewardship toward the fishery resource and user courtesy toward landowners

(iii) **Public Education and Participation**

- to keep the public informed about fisheries issues and opportunities and to increase public participation in fisheries management

(iv) **Native Fishing**

- to meet with the Six Nations of the Grand River Council to discuss and examine items of mutual interest affecting the fishery resources within the watershed

(v) **Scientific and Technical Knowledge**

- to increase knowledge of the biological, economic and social factors affecting local fisheries

Sport Fisheries Management

(i) **Inland Coldwater Streams**

- to meet the projected demand for fishing in streams supporting resident trout

(ii) **Warmwater/Coolwater Rivers and Streams**

- to meet the projected demand for preferred warmwater and coolwater species (bass, pike, walleye)

- to increase utilization of panfish and coarse fish species

(iii) **Inland Lakes and Reservoirs**

- to increase sport fishing activity at underutilized lakes and reservoirs

- to provide fishing opportunities in ponds capable of supporting stocked trout

(iv) Lake Ontario

- to increase utilization of migratory salmonids by anglers while maintaining the current overall level of production

- to increase angling opportunities for warmwater and coolwater species

Baitfish Management

- to prevent overharvest of district baitfish populations

Provincially Rare and Endangered Fish Species Management

- to prevent the extinction of any native fish species

Non-Consumptive Fisheries Management

- to increase opportunities for fish viewing

It is intended that these objectives will be attained by the year 2000.

Targets for fisheries management in Cambridge District were originally presented in the District Land Use Guidelines (DLUG) which were approved in 1983. Subsequently, the Ministry of Natural Resources initiated the district fisheries management planning process which included a testing of the original DLUG targets for fisheries. The review, which used more recent data, resulted in the establishment of new fisheries targets (see Table 1). With the approval of the Cambridge District Fisheries Management Plan, the DLUG targets were amended to incorporate the necessary changes.

Management strategies have been formulated to outline how specific objectives for fisheries management are to be attained. The strategies and tactics presented below are listed according to the objective they are designed to satisfy. Many of these are preferred options that were originally presented in the Background Summary Document. Others are management activities that were suggested by the public during review of the Background Summary Document and Draft Fisheries Plan.

Not all of these strategies and tactics will be utilized immediately. Selected strategies for the first five years of the planning period (1989-1993) are presented in Section 4. The implementation of many of these are dependent on available manpower and funding.

3.2.1 MANAGEMENT OF ALL FISHERIES, DISTRICT WIDE

The management strategies and tactics presented below will benefit all fisheries: sport, commercial and non-comsumptive. The activities are grouped into several specific objectives which together are essential to the achievement of all fisheries targets.

Fish Habitat Protection

Specific Objective

To protect fish habitat from degradation by human activities.

Targets

This objective affects the achievement of all fisheries targets in Cambridge District.

Discussion

Historically the loss of fish habitat in Cambridge District has been substantial. Good quality fish habitat is essential to the maintenance of a balanced fish community which can subsequently generate recreational and/or commercial use.

Past losses in fish habitat can often be attributed to lack of awareness or public apathy. Fortunately, there is an increasing awareness of the need to protect and maintain fish habitat.

The Ministry's involvement in the input and review of municipal planning documents under the jurisdiction of the Planning Act is considered to be a front line for the defense of fish habitat. By means of the municipal plan input process, Ministry programs can identify concerns and constraints to municipalities when development is first being considered for an area. If concerns are not addressed at the input stage, the ability to achieve fisheries objectives is reduced. The interrelationship of Official Plan policies, stormwater master drainage plans and specific subdivisions plans requires that each, in turn, must address Ministry concerns. Failure to expend time at the beginning of the planning process and to maintain consistency leads to omission of concerns or confrontation at various points (planning committee meetings, Council or the Ontario Municipal Board).

In addition to input and review of municipal planning documents, Ministry staff will continue to regulate land use activities directly under their jurisdiction to ensure protection of fish habitat (e.g. Lakes and Rivers Improvement Act, Beach Protection Act, Pits and Quarries Act, Fisheries Act). A public and inter-agency extension program will also be initiated to heighten awareness of habitat issues.

It should be stressed that not all human development activities are incompatible with healthy fish populations. It has been demonstrated, for example, that trout populations in coldwater streams can thrive adjacent to residential subdivisions if these subdivisions are developed with appropriate environmental safeguards. Healthy fish populations are indicative of healthy ecosystems, so measures taken to protect fish habitat will benefit not only anglers, but local residents.

Strategies and Associated Tactics

1. Work with municipalities and other agencies to ensure that land use planning documents are compatible with the district objective for fish habitat protection

   - Ensure recognition of the value and importance of healthy fish communities.

   - Ensure identification of sensitive or significant areas that require protection.

   - Ensure provisions which require planning, design, and construction procedures which eliminate or mitigate impacts on fish habitat.

   - Ensure incorporation of a review mechanism that addresses fisheries concerns when land use changes are considered.

   - Work closely with municipalities and Conservation Authorities to develop a consistent policy for maintaining undisturbed buffer zones between development sites and streambank and shoreline areas. Recommend standards outlined in "Guidelines on the use of Vegetative Buffer Zones to Protect Fish Habitat in an Urban Environment" (OMNR 1987b).

- Implement a policy that will ensure identification, protection and enhancement of existing wetlands in both internal and external planning documents.

2. **Regulate development activities affecting fish habitat through review of development proposals**

   - Work closely with Conservation Authorities and neighbouring OMNR districts to develop and maintain a coordinated and consistent approach to regulating development activities.

   - Implement the Federal Department of Fisheries and Oceans policy for the management of fish habitat, i.e. strive to balance unavoidable habitat loss with habitat replacement and improvement on a project-by-project basis.

   - Use survey and assessment data to identify areas with significant fish habitat or habitat potential.

   - Develop a comprehensive plan review procedure by which development applications are systematically processed according to development proposed and sensitivity of fish habitat present.

   - Ensure establishment of urban stormwater management systems which are appropriate to the sensitivity of the receiving waterbody (e.g. retention areas for warmwater fisheries, groundwater recharge for coldwater streams). Prohibit direct inflow of residential or industrial stormwater into watercourses containing fish habitat.

   - Prevent sedimentation originating from urban development sites by requiring sediment control structures that detain runoff to standards appropriate to the fishery affected.

   - Discourage dredging and channelization where alternate methods of drainage or channel management exist. Where channelization is necessary, ensure that appropriate environmental safeguards are used.

   - Require full sediment control during all construction in or adjacent to water, followed by site rehabilitation immediately following construction.

- Adopt a policy to ensure that the issuing of a Licence to Propogate and Sell Bass and Trout is done concurrently with the issuing of a Permit to Take Water and Certificate of Approval by the Ministry of Environment.

- Liaise with municipalities and other agencies to restrict timing of water related development activities (e.g. bridges and culverts, pipelines and cable crossings, channelization) to months that do not coincide with sensitive fish life history periods (e.g. spawning, egg incubation).

- Review proposals that have the potential to affect groundwater discharge into coldwater streams (e.g. below water table gravel extraction, municipal well proposals).

- Continue the current policy of refusing authorization to construct dams or on-stream ponds on coldwater streams.

3. Continue to enforce legislation pertaining to protection of fish habitat

   - Develop a district enforcement plan which gives habitat protection a high priority in the overall work schedule.

   - Ensure district enforcement and fisheries management staff are kept informed of current legislation, policy and protection/mitigation technology.

   - Ensure adherence to approval conditions on development applications.

   - Provide district enforcement staff with current information regarding locations of development sites which could potentially impact areas with critical fish habitat so that these sites can be monitored regularly during routine enforcement patrols.

   - When fish habitat or populations are impacted by human activities, investigate and lay appropriate charges (e.g. Fisheries Act, Game and Fish Act, Lakes and Rivers Improvement Act, etc.). Cooperate with the Ministry of Environment to investigate and report spills or fish kills.

   - Improve effectiveness of the enforcement program through public participation.

4. Increase public and inter-agency communication to heighten awareness of fish habitat issues

   - Conduct fisheries awareness workshops with municipal staff and officials. Ensure recognition of the biological and socio-economic advantages of healthy fisheries.

   - Liaise with provincial agencies, municipalities and Conservation Authorities to ensure that sensitive and significant fish habitat is identified and receives adequate protection.

   - Provide fish farmers with technical information and advice which will help them optimize use of the groundwater they require to run their operations.

   - Liaise with municipalities and to encourage the maintenance and upkeep of stormwater control structures. Encourage recognition of stormwater as a pollutant that can seriously impair the biological and recreational potential of receiving waters.

   - Work closely with local Conservation Authorities to ensure that flood control works do not disturb critical fish habitat.

   - Liaise with Ministry of Environment (OMOE) to develop criteria for issuance and enforcement of OMOE water taking permits which take into account minimum flows required to sustain fish populations.

Stewardship and Ethics

Specific Objective

To foster an attitude of public stewardship toward the fishery resource and user courtesy toward landowners.

Target

This objective affects all fisheries targets in Cambridge District, but is especially applicable to sport fish management.

Discussion

Many of the problems affecting achievement of fisheries targets in Cambridge District can be traced to a lack of respect or understanding of the relationship between land, water and fish populations (e.g. sedimentation, water quality deterioration) or a general lack of courtesy or respect for the needs of others (e.g. conflicts among users, illegal harvest, trespass and vandalism on private land).

Strategies for this objective stress education and conciliation in an attempt to promote the values of sound land use practices and an understanding among user groups regarding individual needs and the impact of each group on the resource.

Strategies and Associated Tactics

1. Educate/inform the public

   - Prepare a brochure which explains fundamental fisheries management issues such as carrying capacity, fish stocking, and overexploitation. Stress the key role that fish habitat plays in maintaining good fishing.

   - Inform the public of the value and benefits of healthy aquatic ecosystems in providing recreation, economic opportunities, pleasing surroundings and an important environmental indicator.

   - Educate landowners of the negative effects of small recreation ponds on stream trout populations.

2. Promote high standards of angler ethics

   - Advertise examples of good sportsmanship or stewardship.

   - Promote ethical behavior in district publications prepared for anglers.

   - Use enforcement as required to combat littering, vandalism, tresspass and waste of the resource.

3. Develop programs to improve landowner/angler relations

   - Encourage anglers to initiate contacts with landowners for access privileges.

- Promote Community Fisheries Involvement Program (CFIP) and other club projects which improve angler/landowner relations.

Public Education and Participation

Specific Objective

To keep the public informed about fisheries issues and opportunities and to increase public participation in fisheries management.

Targets

This objective affects all fisheries targets in Cambridge District.

Discussion

Management of a fishery resource and its users is a complex matter and one not readily understood by the general public. This stems from unfamiliarity with fundamental concepts such as carrying capacity, species interactions and while appropriate in certain areas for certain purposes, the inadequacy of artificial stocking versus habitat rehabilitation. Often, this unfamiliarity results in unrealistic demands being placed on the resource. At the same time, many fisheries are underutilized because of lack of awareness or a fishing tradition.

The tactics listed below will not only increase public awareness of the local fishery, but will allow interested parties to get more involved in its actual management.

Strategies and Associated Tactics

1. Educate/inform user groups and the general public

   - Prepare and distribute a district angling guide which summarizes local fisheries information, including a large scale map. Promote underutilized fishing areas and fish species.

   - Prepare and distribute a district fisheries news letter which publicizes results of local surveys and projects (e.g. access development, creel survey results, habitat and population assessment and rehabilitation).

- Publicize results of studies on local rare and endangered fish populations.

2. Invite public participation in fisheries management decisions and activities

   - Establish a forum through which the various users of the fishery resource interact with the ministry to exchange information and ideas on fisheries management issues.

   - Seek public involvement before making important fisheries management decisions, (e.g. fisheries regulation changes, alteration/removal of dams to allow fish passage, development of Lake Ontario access points).

   - Encourage voluntary assistance for habitat rehabilitation and fish population enhancement projects.

   - Encourage organizers of local fishing derbies to collect relevant fisheries information.

Native Fisheries

Specific Objective

To meet with the Six Nations of the Grand River Council to discuss and examine items of mutual interest affecting the fishery resources within the watershed. To foster a good working relationship between the parties involved.

Target

How this objective affects the achievement of fisheries targets is difficult to define. The present use of the fishery by members of the Six Nations, as discussed earlier, is not well documented.

Discussion

The Six Nations of the Grand River have expressed an interest to negotiate and develop an Indian Fishing Agreement between the Government of Canada, Government of Ontario and themselves respecting their use of the fishery resources.

The Six Nations are currently examining CFIP proposals and projects aimed at rehabilitating the fishery resources of McKenzie and Boston Creeks.

Strategies and Associated Tactics

1. Continue to meet with the Six Nations of the Grand River on related fishery resource matters

   - Encourage members of the Six Nations community to utilize the CFIP and other programs aimed at improving the fishery resources within the watershed.

   - Work cooperatively with the Six Nations in defining and documenting the use of fishery resource by members of their community.

   - Continue discussions with the Six Nations on their interest to develop an Indian Fishing Agreement.

Scientific and Technical Knowledge

Specific Objective

To increase knowledge of the biological, economic and social factors affecting local fisheries.

Targets

This objective affects all fisheries targets. Accurate information is essential to evaluate the effectiveness of the fisheries program in reaching all targets.

Discussion

In Cambridge District, there is a paucity of data upon which management decisions may be based. Population estimates for coldwater species are too few to be able to extrapolate to areas where no data are available. To date, no population estimate studies have been conducted on warmwater or coolwater species so that they may be protected when development is proposed nearby. Fisheries inventories are lacking on many of our reservoirs, and knowledge of baitfish resources is limited.

To date only a few creel surveys have been conducted on inland waters in the district. Therefore, we do not have a good appreciation for the recreational demands on our inland fisheries.

The following strategies aim to improve our knowledge of the resource and its users in an effective and cost-efficient manner.

Strategies and Associated Tactics

1. Implement ongoing inventory and assessment programs to monitor fish populations and habitats

   - Initiate aquatic habitat inventories (stream, river and lake surveys) on unsurveyed waters. Resurvey waters as required.

   - Establish an index station program which samples representative sites on selected rivers, streams and lakes to monitor species composition, abundance levels and habitat quality. Monitor each station for a minimum of three years.

   - Determine productivity and allowable yield estimates for district baitfish populations by implementing suitable population and habitat studies (estimates of harvestable area, index stations, harvest simulation).

   - Support studies on district waters of Lake Ontario conducted by the Lake Ontario Fisheries Unit (LOFU).

   - Conduct aerial surveys of important fisheries to assess habitat. Record with video camera for use in plan input and review, and habitat protection.

   - Conduct surveys of known populations of rare fish to determine abundance and habitat quality. Sample areas that contain similar habitat.

   - Conduct temperature studies on selected coldwater streams to assess their present suitability for trout and potential for rehabilitation.

   - Assess fish stocking programs by conducting creel survey and fish population estimate studies.

   - Sample fish communities at representative sites to determine distribution and range of gamefish species.

- Conduct spawning surveys on coldwater streams to monitor adult abundance and identify critical spawning areas. Monitor each stream for at least three years.

2. Determine reliable estimates of resource use

   - Develop and regularly conduct creel survey studies on representative inland waters to monitor demand and exploitation rates.

   - Support efforts by the LOFAU to conduct regular creel survey programs to monitor the boat and shoreline fishery of Lake Ontario's western basin.

   - Monitor selected or representative fishing derbies and tournaments to determine impacts or contributions to overall fishing pressure and harvest.

   - Work with the commercial bait fishing industry to improve the accuracy and usefulness of the mandatory annual harvest reports filled out by licenced operators.

   - Compare and refine estimates of resource use, resource potential and fisheries targets as more accurate information becomes available.

3. Encourage and facilitate information collected by other agencies

   - Work closely with local Conservation Authorities to review work programs and exchange relevant fisheries data to avoid duplication in ongoing studies.

   - Encourage researchers at local universities to study topics relevant to local fisheries management (e.g. baitfish productivity and allowable yield, groundwater withdrawal effects on coldwater fisheries).

3.2.2 SPORT FISHERIES MANAGEMENT

Objective

To meet the demand for sport fishing within the limits of a wisely managed and rehabilitated resource.

Target

The sport fishing target for Cambridge District is to provide 177,100 angler-days of recreation annually by the year 2000. The annual yield of fish required to support this recreation amounts to 198,400 kg. The sport fishing target is the summation of yield and recreation opportunities from four management zones: inland coldwater streams; warmwater/coolwater rivers and streams; inland lakes and reservoirs; and Lake Ontario (Table 1).

Inland Coldwater Streams

Specific Objective

To meet the projected demand for coldwater fishing in streams capable of supporting resident trout.

Target

The sport fishing target for inland coldwater streams is 11,500 angler-days of recreation per year with a harvest of 2,300 kg/yr by the year 2000.

Discussion

Streams supporting resident trout species (brook and brown trout) are found primarily along the Niagara Escarpment, and in moraine and sand plain physiographic regions. These areas have soils which carry groundwater in sufficient volume to maintain the cold water temperatures and consistent base flows required for trout survival.

Many coldwater streams in Cambridge District are stressed by a variety of land use practices associated with agriculture and urbanization. Poor cultivation practices, clearing and draining of forests and wetlands, pond and dam construction, poor urban stormwater management and water abstraction all contribute to degrade habitat. Degraded fish habitat is not capable of supporting trout (stocked or wild) in numbers required to sustain angler demand.

Supply-demand analysis has shown that coldwater streams in Cambridge District will be just able to meet angler demand by the year 2000. If the recent local trends in population growth, economic development and habitat degradation continue, demand for trout fishing in the year 2000 could even exceed the capacity of local streams to produce trout.

In order to meet the sportfishing objective for coldwater streams it will be necessary to concentrate on protecting existing trout habitat and rehabilitating degraded habitat. The latter includes creation of new habitat in localized areas. Additional management effort will be directed toward maximizing utilization of existing fisheries (i.e. catch and release fishing areas), improving access to streams on private property, and increased trout stocking at selected locations to satisfy demand and divert pressure from resident stocks.

Strategies and Associated Tactics

Strategies and tactics associated with protection of trout habitat have already been outlined in detail in Section 3.2.1 (page 16) and will not be repeated here. It should be stressed that although these management activities are not presented in this section, they form a major component of the management direction for coldwater streams.

1. Rehabilitate degraded trout habitat

   - Use stream survey and assessment data to identify streams with good potential for restoration. Prepare individual work plans to specify the type of restoration required for each stream.

   - Undertake habitat improvement and creation projects on the above streams via public involvement (Community Fisheries Involvement Program - CFIP) and district fisheries work programs.

   - Reduce impacts of cattle trampling on trout streams by providing landowners with assistance to erect streamside fencing.

   - Initiate a dam removal/modification program on coldwater streams. Obtain landowner permission and cooperation prior to implementation. Ensure maintenance of existing barriers to sea lamprey migration.

- Promote and facilitate reforestation of headwater areas and erosion prone land.

2. Protect sensitive wild trout populations

   - Construct or maintain barriers to selectively restrict migratory salmonids from stream sections that support sensitive resident trout populations. Public and inter-agency consultation will be required prior to construction of new barriers

   - Adopt a policy of not issuing a Licence to Propagate and Sell Bass and Trout to prospective fish farmers who wish to establish their operation at a location that is likely to impact wild trout populations.

   - Ensure that OMNR Fish Transfer Permits are obtained for all fish stocking by the private sector. Compliance will reduce the risk of introduced fish species competing with wild stocks.

3. Expand opportunities to fish for trout in inland waters

   - Encourage and facilitate angling in stocked trout ponds to satisfy demand for trout fishing opportunities, yet reduce pressure on heavily fished streams (see page 36).

   - Stock appropriate rivers and streams with hatchery reared rainbow trout to provide additional angling opportunities. Monitor effectiveness via periodic creel surveys.

   - Investigate feasibility of introducing brown trout fry or fingerlings from wild stock into selected rivers and streams in order to establish new self sustaining trout fisheries.

   - Implement special harvest and gear restrictions (i.e. reduced bag limit with size and tackle restrictions) on a 2 km long section of Whitemans Creek on an experimental basis to determine effectiveness in increasing recreation from a limited resource base. Assess effectiveness of regulations in a scientific manner.

   - Encourage and facilitate attempts by angling clubs to develop public access to streams on private land through landowner agreement.

- Investigate the feasibility of incentives, easements or aquisition to provide public access to important trout fisheries that presently have limited access.

- Support acquisition programs by other agencies (e.g. Conservation Authorities) which would result in increased fishing opportunities or habitat protection. Provide these agencies with a priority list of sites.

4. Minimize illegal harvest of resident trout

   - Enforce existing legislation and prosecute individuals taking trout illegally.

   - Recommend creation of new fish sanctuaries in areas where trout are vulnerable and illegal harvest is a major problem.

   - Develop a district enforcement work plan which priority rates enforcement efforts to concentrate on problem areas.

   - Increase liaison with the Ontario Federation of Anglers and Hunters (OFAH), sportsmans clubs and landowners to report violations.

Warmwater/Coolwater Rivers and Streams

Specific Objectives

There are two specific objectives for sportfishing in warmwater and coolwater rivers and streams:

1. To meet the projected demand for preferred species (bass, pike, walleye).
2. To increase utilization of panfish and coarse fish species.

Target

The sport fishing target for warmwater and coolwater rivers and streams is 78,200 angler-days of recreation annually with a harvest of 39,100 kg/yr by the year 2000.

Discussion

The potential yield of the warmwater and coolwater rivers in Cambridge District is much greater in absolute terms than that of inland coldwater streams. Rivers in the Grand River watershed (Grand, Nith, Conestogo, Speed) as well as some smaller streams provide excellent opportunities to catch bass, pike, perch, panfish and in some cases, walleye. Because most of these rivers flow through or near large urban centres, they have the potential to provide convenient recreation for most residents of the district.

The potential sportfish yield from these rivers is 108,300 kg/yr which is considerably higher than both the current and projected use for this type of fishing. Although this appears to indicate that the resource is presently being underutilized by a large amount, this is probably only true for panfish and coarse fish species (i.e. sunfish, crappies, suckers, carp, bullhead). At some locations, preferred species (bass, pike, walleye) may be utilized at or over current production levels due to habitat degradation and localized heavy angling pressure.

Management of warmwater and coolwater rivers and streams will emphasize strategies that will maximize production and utilization of preferred species through habitat protection, creation and rehabilitation, range expansion, access improvement and public education. At the same time, emphasis will be placed on increasing utilization of panfish and coarse fish species through promotion and enhancement of angling opportunities.

Although not directly related to the management of warmwater and coolwater rivers, an additional management strategy has been added to this section since the release of the draft fisheries plan. The strategy addresses the considerable interest which was expressed by individuals, angling clubs and municipalities in establishing a major spring and fall migratory salmonid fishery in the Grand River upstream to the City of Cambridge.

Considerable effort and expense would be required to create this type of fishery. Therefore, the strategy is to examine the biological impacts, technical feasibility, and cost-effectiveness of this proposal. Included in this investigation will be an examination of compatibility with Lake Erie and Niagara District Fisheries Management Plans.

Strategies and Associated Tactics

1. **Rehabilitate degraded habitat, create additional habitat**

   - Work with Ministry of Environment (OMOE) and municipalities to reduce nutrient input from municipal sewage effluent.

   - Encourage and facilitate the application of innovative fish habitat creation and enhancement techniques when reviewing development proposals adjacent to large streams or rivers (e.g. creation of shoreline diversity and spawning habitat during final grading of floodplain gravel extraction pits or riverside residential lots).

   - Encourage Conservation Authorities to incorporate fish habitat improvements in major erosion protection or flood control engineering works.

   - Work with other agencies (Conservation Authorities, OMAF) to promote soil conservation and stewardship toward the fishery resource to farmers and landowners.

2. **Increase availability of preferred fish species**

   - Extend the range of Grand River walleye upstream over barriers to migration by initiating ripe adult transfers and jar/pond culture and fingerling stocking.

   - Encourage and facilitate where possible the construction of fish passage facilities over dams in the Grand River watershed that restrict access of sportfish (especially walleye) to suitable spawning and rearing habitat.

   - Support the construction of launching ramp facilities to encourage use of deep, slow portions of the Grand River by boat anglers.

   - Promote underutilized fishing areas via news release and mention in district angling guide.

3. Increase fishing activity for underutilized fish species

   - Work with municipalities developing riverside parks to incorporate facilities which enhance angling opportunities (e.g. wheelchair access, benches and docks, interpretive displays, signs to direct anglers to good locations).

   - Promote underutilized species in a district angling guide and during extension contacts.

   - Support fishing derbies for underutilized fish species by having OMNR staff present at check stations and official ceremonies.

4. Reduce illegal harvest

   - Develop a district enforcement work plan which organizes enforcement efforts to concentrate on problem areas.

   - Recommend creation of new fish sanctuaries in areas where fish are vulnerable and illegal harvest is affecting sportfish populations.

   - Recommend modification of existing angling regulations to establish an extended fall angling season (to Dec 31) for rainbow and brown trout in the Grand River upstream to Paris Dam. This would allow anglers to possess accidentally caught migratory trout during the fall months.

   - Increase liaison with the Ontario Federation of Anglers and Hunters (OFAH), sportsmen's clubs, and landowners to report violations.

5. Examine the technical feasibility, biological impacts and cost effectiveness of establishing a migratory salmonid fishery in the Grand River. Further management action will be based on the findings and recommendations of this study

   - Consult with all appropriate agencies and jurisdictions (Lake Erie Management Committee, Lake Erie Fisheries Unit, Niagara District, Grand River Conservation Authority) to examine biological and socio-economic impacts and consistency with existing management objectives for Lake Erie and the Grand River. Examine implications of various management scenarios (e.g. stock both rainbow trout and Pacific salmon vs trout only, stock at various stocking densities, creation of new fishways vs use of existing fishways only).

   - Contact agencies that presently maintain artificial migratory salmonid fisheries on warmwater rivers (e.g. Grand and St. Joseph Rivers in Lake Michigan watershed) to examine the technical and financial requirements and cost effectiveness of this type of fishery.

   - Utilize information collected through implementation of the above tactics to estimate the cost, benefits and consequences of various migratory salmonid management scenarios for the Grand River.

   - Summarize information in a report which makes detailed recommendations for management action. Implement recommendations following public consultation.

Inland Lakes and Reservoirs

Specific Objectives

There are two specific objectives for sportfishing in this management zone:

1. To increase sport fishing activity at underutilized lakes and reservoirs.
2. To provide fishing opportunities in ponds capable of supporting stocked trout.

Target

The sport fishing target for inland lakes and reservoirs is 11,500 angler-days of recreation annually and 5,800 kg/yr by the year 2000.

Discussion

Twenty inland lakes and reservoirs in Cambridge District (total area 2,950 ha) provide fishing opportunities for warmwater and coolwater fishers (bass, pike, perch, walleye, bullheads, sunfish). Numerous lakes and ponds smaller than 10 ha contain sport fish, but provide little recreational potential due to limited public access.

Supply-demand analysis shows that potential yield for lakes and reservoirs in Cambridge District (52,000 kg/yr) far exceeds projected use (5,800 kg/yr). Unfortunately, a large proportion of this potential is presently not being realized due to water level fluctuations caused by operating regimes in water management reservoirs.

Management emphasis for inland lakes and reservoirs will concentrate on maximizing sport fish production within the limits imposed by water management priorities. Additional strategies and tactics will emphasize promotion and enhancement of existing angling opportunities.

There are no inland lakes or ponds in Cambridge District that support significant self-sustaining trout fisheries, but ponds in seven Conservation Areas (total area 45 ha) are managed as artificial trout fisheries. Rainbow and brook trout of harvestable size (25-35 cm) are stocked in these to provide immediate recreation opportunities. These ponds are especially popular with family groups, senior citizens and handicapped anglers because of easy access and a park-like setting.

Public response to the Fisheries Plan Background Information and Optional Management Strategies document indicates that there is strong support for significantly more stocking of trout in public areas. This strategy has merit, for not only does it provide immediate coldwater angling opportunities, but it diverts pressure from sensitive wild trout stocks. It is important, however, that this type of management does not create unreasonable expectations regarding the capacity of the resource to provide recreation. An artificial stocking program should be accompanied by public education which stresses the expense and limitations of stocking verses the value of habitat protection and restoration to maintain self sustaining fish populations.

1. **Improve fish habitat and water quality in inland waterbodies**

   - Work with Conservation Authorities to identify and assess fish habitat and angling potential in inland lakes and reservoirs. Develop rehabilitation work plans.

   - Initiate habitat improvement and creation projects on the above waterbodies (e.g. artificial reefs, spawning bed creation) via public involvement (e.g. CFIP) and district fisheries work programs.

   - Cooperate with Conservation Authorities and other government agencies (Ministry of Agriculture and Food, Ministry of Environment) to reduce nutrient and sediment loading in reservoirs (e.g. Rural Beaches Program).

   - Cooperate with efforts by the Ministry of Environment and Puslinch Lake Cottage Owners Association to develop and implement a Remedial Action Plan to restore water quality and recreation potential in Puslinch Lake.

2. **Work with Conservation Authorities to reduce negative impacts of seasonal water level fluctuation in water management reservoirs**

   - Determine the feasibility of modifying reservoir management criteria to incorporate fisheries concerns (e.g. minimum standards for winter pool volume, water level maintenance during egg incubation periods of important fish species).

   - Investigate feasibility of structural enhancement which would mitigate impacts of water draw down (e.g. dykes and levees to create spawning and nursery embayments).

3. **Improve access and fishing conditions in warmwater lakes and reservoirs**

   - Provide assistance to Conservation Authorities to construct launching ramps, fishing piers, wheelchair access and fish cleaning stations.

   - Mark selected natural and artificial reefs and structures with bouys so that they can be easily located and effectively fished by anglers.

- Provide municipalities with information and assistance to enhance angling opportunities in small ponds under their jurisdiction.

- Collect biological data to determine if sportfish populations are being overharvested at popular inland waterbodies. Use data to examine if changes in regulations would improve angling quality. Implement appropriate regulations (e.g. size or catch limits, seasons) on an experimental basis if biological justification exists.

- Introduce selected fish species (e.g. walleye, black crappie, channel catfish) into suitable waterbodies that presently lack fish species desired by anglers. Introductions must be preceded by detailed habitat and population assessment to ensure project success and avoid negative impacts to adjacent fisheries.

4. Promote underutilized fishing opportunities in inland lakes and reservoirs

   - Describe and encourage angling in underutilized waterbodies via news release and a district angling guide. Stress areas which provide excellent opportunities for children (i.e. lakes containing abundant panfish).

   - Encourage local Conservation Authorities and municipalities to promote angling opportunities and advertise locations and fishing conditions in lakes, ponds and reservoirs in their jurisdiction.

   - Support fishing derbies for panfish and coarse fish species. Encourage the harvest of all fish caught.

5. Provide coldwater fishing opportunities by creating artificial "put and take" fisheries in selected waters to satisfy demand and divert pressure from resident trout populations

   - Purchase disease free trout from private fish farms to stock in suitable public ponds. Assess effectiveness via periodic creel surveys.

   - Encourage the private sector to provide artificial fisheries bases on the "user pays" concept.

   - Advertise locations of fishing areas that are sustained by stocking programs.

Lake Ontario

Specific Objectives

There are two specific objectives for sport fishing in the Cambridge District waters of Lake Ontario:

1. To increase utilization of migratory salmonids by anglers while maintaining the current overall level of production.
2. To increase angling opportunities for warmwater and coolwater fish species.

Target

The district target for sport fishing in Lake Ontario is 75,900 angler-days of recreation annually and 151,200 kg/yr by the year 2000.

Discussion

The Cambridge District waters of Lake Ontario support a small warmwater fishery (primarily in Hamilton Harbour, Cootes Paradise and a few shoreline locations) and a large "put-grow-and-take" coldwater fishery in both near and offshore waters of the western basin of the lake.

Although angling success for stocked migratory salmonids in Lake Ontario is excellent, a number of problems face the coldwater fishery. The most serious is the issue of contaminants in fish flesh. Contaminant levels in some fish species exceed current government health standards. Members of public responding to the District Fisheries Plan Background Information Document ranked contaminants as by far the most serious problem facing management of the Lake Ontario fishery. Additional issues include habitat loss, predation pressure on the smelt/alewife forage base and lack of suitable access to shoreline and open water fishing areas.

Management direction for migratory salmonids in Cambridge District will concentrate on protection and restoration of fish habitat and water quality, maintenance of a stable, diverse salmonid community through stocking and natural reproduction, cooperation with the Federal Department of Fisheries and Oceans to control sea lamprey predation and improved public access. It should be noted that overall stocking density for salmonids will not exceed current levels due to the concern for the limitations of the forage base.

Warmwater and coolwater fish species do not contribute a significant portion of the Lake Ontario yield in Cambridge District. Except for the Hamilton Harbour/Cootes Paradise system, most of Lake Ontario's western basin is much too deep, cold and featureless to support these species.

Management emphasis for warmwater and coolwater fisheries in Lake Ontario will concentrate on rehabilitating fish habitat in Cootes Paradise and Hamilton Harbour and identifying additional areas which have the potential to support harvestable populations of these species.

Strategies and Associated Tactics

1. Maintain a mix of wild and stocked salmonid species that satisfies angler demand, yet can be supported by the forage base

   - Do not eliminate planting of any species currently stocked in district waters of Lake Ontario.

   - The number of each species stocked may change, but the total stocking effort will not exceed current levels unless new information concerning forage base limitations indicates otherwise.

   - Support studies by the Lake Ontario Fisheries Unit (LOFU) to monitor forage fish population levels and migratory salmonid diet and growth rates to determine if predation is depressing the forage base.

   - Monitor angler species preferences through surveys and consultation with representatives from local angling clubs.

   - For each species, reduce stocking levels at the same rate that natural reproduction levels increase due to habitat rehabilitation. This will maintain the forage base at present levels.

   - Stock lake trout juveniles at locations with potential spawning habitat.

   - Stock coho salmon in Bronte Creek to sustain a fall stream/harbour fishery and diversify the open water fishery.

   - Stock chinook salmon at locations and at densities that will maximize utilization by anglers, yet minimize problems caused by large numbers of spawning fish in confined areas.

2. **Maximize rainbow trout natural reproduction**

   - Evaluate the capability of candidate streams to produce trout by conducting detailed habitat assessment.

   - Conduct fish population estimates at index stations on selected streams to assess stocking and/or determine reproductive success.

   - Stock hatchery reared yearlings of wild stock at sites with potential spawning and nursery habitat.

   - Repair degraded trout habitat by preparing work plans, then performing the required rehabilitation through community involvement or district fisheries work programs.

3. **Facilitate the re-introduction of a self-sustaining Atlantic salmon population in the Credit River Watershed.**

   - Cooperate with OMNR Fisheries Research Section, Maple District and the Credit Valley Conservation Authority to implement aspects of the Atlantic Salmon Experimental Management Plan pertaining to portions of the Credit River Watershed lying in Cambridge District.

   - Assist Fisheries Research staff conducting fish population and habitat assessment studies to monitor the salmon population and identify critical production and rearing sites.

   - Establish a priority system for habitat rehabilitation projects which will enhance salmon production and migration.

   - Facilitate adult Atlantic salmon passage over existing dams on the Credit River that are located in Cambridge District.

   - Investigate benefits and consequences of allowing Atlantic salmon migration over existing man-made barriers on Black and Rogers Creeks in order to increase available spawning and nursery habitat. Invite public input.

   - Establish new angling regulations (size limits, closed seasons and/or sanctuaries as specified in the Atlantic Salmon Experimental Management Plan) which will protect adults and juveniles from overharvest. These regulations may be changed once the population becomes established.

4. **Improve access to Lake Ontario for boat anglers**

   - Work with municipalites and Conservation Authorities to upgrade existing and create additional boat launching/trailer parking facilities at suitable public areas along the Lake Ontario shoreline. Provide financial assistance where appropriate.

5. **Expand angling opportunities in tributaries and along the Lake Ontario shoreline**

   - Recommend modification of angling regulations to establish an extended fall angling (to Dec 31) zone for rainbow and brown trout on lower Bronte Creek (Rebecca Street to Highway 5).

   - Consult with municipality, user groups and local property owners to determine the feasibility of eliminating the Rebecca Street to Lakeshore Road fish sanctuary on lower Bronte Creek.

   - Encourage municipalities, Conservation Authorities and private corporations who own shoreline property to assist in the provision of facilities for shoreline anglers (e.g. handicapped angler access, small pier construction, shoreline habitat creation).

   - Stock brown trout at locations that will result in the maintenance of a rivermouth and shoreline fishery through much of the angling season.

6. **Reduce the impact of contaminants on aquatic communities**

   - Work cooperatively with other agencies to reduce nutrient, sediment and toxic substance inputs into all district watercourses.

   - Assist Ministry of Environment with the collection of fish samples for contaminants analysis.

   - Continue to provide information to the public regarding consumption guidelines.

7. **Identify locations which presently or potentially support warmwater and coolwater fish habitat or fishing opportunities**

   - Solicit information regarding past or present spawning and nursery areas and good fishing locations from bait fishermen, angling clubs and charter boat operators.

   - Work with the LOFU to survey the Lake Ontario shoreline and document critical habitat areas.

8. **Improve warmwater and coolwater fish habitat in Lake Ontario**

   - Determine the feasibility of repairing degraded spawning or nursery habitat via site assessment and consultation with LOFU.

   - Where habitat restoration or creation is feasible, prepare a work plan and perform the required rehabilitation.

9. **Cooperate with other agencies to rehabilitate the warmwater/coolwater fish community in Hamilton Harbour**

   - Continue involvement with other agencies and interest groups to develop a Remedial Action Plan (RAP) to restore the Hamilton Harbour/Cootes Paradise system as a viable and productive aquatic ecosystem.

   - Facilitate implementation of structural habitat improvements which will restore the warmwater fish community as outlined in the RAP.

   - Assist in a northern pike re-introduction program via adult fish transfers.

10. **Minimize illegal or inappropriate harvest of migratory salmonids**

    - Do not issue commercial (food) fishing licences for Cambridge District waters of Lake Ontario.

    - Increase Conservation Officer boat patrols on Lake Ontario to police the open water sport fishery.

- Develop a district enforcement work plan which organizes enforcement efforts to concentrate on problem times and areas (e.g. salmon concentrations in tributaries, rainbow trout spawning).

- Recommend creation of fall and/or winter fish sanctuaries in areas where trout and salmon are vulnerable and illegal harvest is a major problem.

- Increase liaison with the Ontario Federation of Anglers and Hunters (OFAH), sportsmen's clubs and landowners to report violations.

11. Control sea lamprey predation

- Assist the Sea Lamprey Control Centre (Department of Fisheries and Oceans) to monitor sea lamprey abundance.

- Facilitate the efforts of the Sea Lamprey Control Centre to reduce sea lamprey numbers in local streams.

12. Promote fishing opportunities in Lake Ontario

- Promote spring smelt fishing via news release and description in a district angling guide.

- Encourage and assist local Conservation Authorities and municipalities to promote Lake Ontario angling.

- Describe Lake Ontario angling opportunities in a district angling guide.

3.2.3 BAITFISH MANAGEMENT

Specific Objective

To prevent overharvest of district baitfish populations.

Target

The target for commercial baitfish management is to provide 139,000 dozen baitfish annually from natural sources by the year 2000.

Discussion

The 33 baitfish harvest licences presently issued in Cambridge District are held by 12 operators who fish in seven baitfish management zones. Reported annual harvest over the last ten years has fluctuated about a mean of approximately 139,000 dozen. Most of this harvest comes from Luther Lake and warmwater rivers and streams. Because there is a concern that the resource is presently being harvested at or near capacity, no new harvest licences have been issued in the district since 1976.

Projected use for baitfish is expected to exceed the amount that can be supplied locally. Attempts by harvesters to supply this increased use could result in overexploitation of inland baitfish stocks, increased competition between harvesters and hostility between harvesters and dealers because of supply shortages and competition with the export market.

Management direction for bait fisheries will concentrate on preventing overexploitation. Additional strategies and tactics will maximize utilization of existing stocks through consultation with the industry to develop a more comprehensive licencing and assessment system. It is important to note that entry into the commercial bait fishery will continue to be limited until more accurate potential yield estimates are determined.

Strategies and Associated Tactics

1. Protect and maintain existing baitfish populations

   - Enforce existing provincial regulations which govern the capture and sale of baitfish.

   - Limit entry into the commercial fishery by refusing to issue new licences. Continue this policy until more comprehensive assessment information indicates that the resource is capable of sustaining additional harvest pressure.

   - Inform commercial harvesters and dealers of all requirements relating to the baitfish industry as set out in legislation.

   - Develop a communications package to advise anglers of all legislation related to the harvest of baitfish for personal use.

- Prevent the introduction of competitive fish species or the spread of disease by enforcing pertinent regulations

2. Work with the baitfish industry to develop a comprehensive baitfish management program

   - Encourage the establishment of a local (district) baitfish management council comprised of representative harvesters and dealers.

   - Conduct periodic meetings and workshops to discuss current problems and alternatives for their resolution. Invite participation of all harvesters and dealers, as well as those on the harvest licence waiting list.

   - Investigate alternatives to the present harvest licencing and zone system which would maximize utilization of existing stocks, yet minimize competition and overharvest (some alternatives include zone boundary changes, institution of an exclusive use block system, creation of Lake Ontario zones or some combination of these).

   - Maintain and annually update a waiting list for baitfish harvest licences. Issue new licences from this list only when available biological information indicates that increased harvest is allowable.

   - Work with industry representatives to evaluate and improve the accuracy and usefulness of the existing annual harvest reports that are filled out by harvesters as a condition of licence renewal.

   - If improved harvest or potential yield estimates indicate that the current estimates are inaccurate, initiate revisions to the DLUG and Fisheries Plan targets for baitfish management.

3. Ensure a consistent supply of baitfish to local dealers and anglers

   - Facilitate private culture and sale of baitfish species in order to decrease pressure on wild populations and supplement existing supply. Provide technical advice and encourage financial incentives at the provincial level.

- Consider introduction of suitable baitfish species to new areas if it can be determined that the introduction will be compatible with other fish species.

- Work with a local baitfish council to establish a communication/distribution system that will ensure local dealers have access to baitfish during peak demand and supply shortage periods.

- Develop a set of minimum standards for baitfish holding and transport facilities (tanks, aerators, water supply) to reduce waste through mortality. Enforce standards as a condition of licence renewal.

- Provide harvesters and dealers with technical information and advice to reduce mortality due to handling and holding facilities.

4. Develop a comprehensive baitfish assessment program

   - Estimate productivity and allowable baitfish yields for local waters by implementing population and habitat studies at representative locations.

   - Identify critical areas of baitfish habitat and harvest potential through habitat mapping and communication with commercial harvesters.

3.2.4 PROVINCIAL RARE AND ENDANGERED FISH SPECIES MANAGEMENT

Objective

The objective for management of rare and endangered fish species in Cambridge District is to prevent the extinction of any native fish species.

Target

The district target for rare and endangered fish species is to ensure that no native fish species becomes extinct.

Discussion

There are four provincially significant species known to occur in Cambridge District - river redhorse sucker, black redhorse sucker, silver shiner and redside dace. These are recognized by the Committee on the Status of Canada (COSEWIC) as being either rare or threatened.

Efforts will continue to protect these species and their habitat. In addition, attempts will be made to monitor, document and publicize the status of each rare, endangered or threatened population.

Strategies and Associated Tactics

1. Identify and monitor populations of rare or endangered fish species

   - Repeat inventories of aquatic habitat on all district streams as required so that information on fish populations is as current as possible. Most populations of rare or endangered fish are discovered while performing routine survey or assessment duties.

   - Conduct surveys of known populations of rare fish to determine abundance and habitat quality. Sample areas that contain similar habitat.

   - Prepare status reports on each rare and endangered fish species found in the district.

   - Support the efforts of other organizations such as COSEWIC and the Royal Ontario Museum that are investigating the status of rare and endangered fish species.

2. Protect rare fish populations and their habitat

   - Continue to enforce existing legislation that protects fish habitat, especially that known to support rare fish populations.

   - Ensure that this habitat is recognized and protected when reviewing development proposals.

3. Keep the public informed of the status of rare and endangered fish species

   - Publicize the results of status reports on rare fish species.

   - Support public awareness and research efforts by other agencies and organizations.

4. Solicit the cooperation of local bait fishermen to locate and protect populations of rare and endangered fish species

   - Provide baitfish harvesters with information which will help them recognize rare or endangered species they could possibly encounter. Solicit their cooperation in identifying new populations.

   - Solicit baitfish harvesters cooperation in reducing incidental harvest of rare or endangered fish species.

3.2.5 NON-COMSUMPTIVE FISHERIES USE MANAGEMENT

Specific Objective

To increase opportunities for recreational fish viewing in Cambridge District.

Target

There is no target for fish viewing in Cambridge District.

Discussion

Fish viewing is growing in popularity as a family recreation activity. Spring and fall salmonid migrations and spawning activities at several Lake Ontario tributaries (Bronte, Oakville, Grindstone and Spencer Creeks) provide excellent opportunities to observe large fish in a relatively natural setting. Walleye can be observed spawning in the Grand River in the Brantford area.

Management of fish viewing activity in Cambridge District will concentrate on promoting and enhancing existing viewing opportunities.

Strategies and Associated Tactics

1. Promote and enhance opportunities for fish viewing

   - Publicize the best locations and times to view fish migrations or spawning activities via news release and information brochures.

   - Install displays at selected fish viewing areas to improve public knowledge of the resource.

   - Invite organized groups to participate in projects that involve fish handling or collections (e.g. fish transfers, egg collection, population assessment).

   - Facilitate attempts to improve public access to areas with fish viewing potential that are located on private property.

4.0 IMPLEMENTATION

4.1 GENERAL BACKGROUND

This Fisheries Management Plan provides the direction for fisheries management activities within the Cambridge District to the year 2000. Within that period all activities should be consistent with the strategies and tactics outlined in this plan.

A Fisheries Management Plan for the Canadian waters of Lake Ontario is now in preparation. Fisheries management strategies outlined in the Lake Ontario Plan, pertaining to Cambridge District waters or resource users, will be implemented through the tactics outlined in this document.

Generally, strategies identified in this Fisheries Management Plan will be implemented through:

- the preparation of five year implementation schedules;
- programs and projects approved and funded under the Ministry of Natural Resources work planning process;
- input to or participation in other programs carried out by the Ministry of Natural Resources or local Conservation Authorities;
- review and approval of work plans and proposals from municipalities, private landowners and other government agencies;
- cooperative efforts with local clubs, associations and municipalities.

This section of the Fisheries Management Plan will establish the first five year (1989-1993) Implementation Schedule. Annual work plans will be developed from the priorities established in this Implementation Schedule. The annual work plan will address both the cost and timing for the implementation of tactics.

While this schedule will be updated annually, the Implementation Schedule for subsequent five year periods will be formally prepared in 1993 and 1998 respectively. Those schedules will be subject to public notice and review. Should any significant modifications or revisions to the Implementation Schedule or Fisheries Management Plan be required, the same public review and approval process shall be followed.

Fisheries management projects to be undertaken in accordance with the Plan are subject to the requirements of the Environmental Assessment Act. As a result of complying with class assessment requirements, there may be a change to the specific factors identified in this Plan.

4.2 IMPLEMENTATION SCHEDULE 1989 - 1993

This section outlines fisheries management activities that the OMNR proposes to carry out during the 1989-1993 period in Cambridge District. Specific tactics are organized by fishery type, management zone and management objective they are designed to satisfy. The tactics are not arranged in any order of priority. Each tactic is accompanied by a priority list of sites and activities that can be completed under the existing (1989) level of funding and those that will require additional funding to complete. As funding becomes available, the top ranked projects in the additional funding column will be completed first.

The enforcement program is a major component of fisheries management. It includes enforcement of regulations associated with harvest controls (e.g. seasons, catch limits, etc.) and habitat protection. Habitat protection which includes monitoring of projects to ensure compliance with the conditions of OMNR permits and approvals is becoming increasingly important as development pressures increase. To assist in coordinating enforcement activities, districts are developing enforcement plans which will help guide the enforcement program.

Numerous fisheries management projects, such as fish stocking and aquatic habitat rehabilitation, have been completed in recent years by local organizations under the Community Fisheries Involvement Program (CFIP). Since it is difficult to predict similar projects which will be initiated in the future, they have not been included in this Schedule.

IMPLEMENTATION SCHEDULE 1989 - 1993

HABITAT PROTECTION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Work with municipalities and other agencies to ensure that land use planning documents are compatible with the district objective for fish habitat protection.		
- Ensure recognition of the value and importance of healthy fish communities.	- Inter-agency liaison district wide - periodic presentations and correspondence	- Increase level of extension activity
- Ensure identification of sensitive or significant areas that require protection	- District wide. Update mapping of important areas and provide to planning agencies	- Utilize computer mapping techniques (e.g. Geographic Information System - GIS)
- Ensure provisions which require planning, design and constuction procedures which eliminate or mitigate impacts	- Liaison with planning agencies district wide - meetings and correspondence	- Increase level of extension activity - periodic workshops
- Ensure incorporation of a review mechanism that addresses fisheries concerns when land use changes are considered	- Liaison with planning agencies as above	- Increase level of extension activity
- Work closely with municipalities and Conservation Authorities to develop a consistent policy for maintaining undisturbed buffer zones between development sites and streambank and shoreline areas. Recommend standards outlined in "Guidelines on the Use of Vegetative Buffer Zones to Protect Fish Habitat in an Urban Environment" (OMNR 1987b)	- Frequent meetings with planning agencies until consistent standards are established	
- Implement a policy that will ensure identification, protection and enhancement of existing wetlands in both internal and external planning documents	- District wide liaison with planning agencies - periodic meetings and correspondence	

IMPLEMENTATION SCHEDULE 1989 - 1993

HABITAT PROTECTION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
2. Regulate development activities affecting fish habitat through review of development proposals.		
- Work closely with Conservation Authorities and neighbouring OMNR districts to develop and maintain a coordinated and consistent approach to regulating development activities.	- District wide. Meet to resolve areas of conflict or duplication.	
- Implement the Federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principles of net gain/no loss of fish habitat, i.e. strive to balance unavoidable habitat loss with habitat replacement and improvement on a project-by-project basis.	- District wide. Consistent review and delivery by district.	
- Use survey and assessment data to identify areas with significant fish habitat or habitat potential.	- District wide. Provide planning staff with updated information.	- Utilize computer mapping (e.g. Geographic Information System - GIS).
- Develop a comprehensive plan review procedure by which development applications are systematically processed according to development proposed and sensitivity of fish habitat present.	- District wide. Involve Conservation Authorities.	- Utilize computer mapping.
- Ensure establishment of urban stormwater management systems which are appropriate to the sensitivity of the receiving waterbody (e.g. retention areas for warmwater fisheries, groundwater recharge for coldwater streams). Prohibit direct inflow of residential or industrial stormwater into watercourses containing fish habitat.	- District wide. Implement via conditions of approval under Planning Act and Lakes and Rivers Improvement Act.	- Ensure systems reflect current technology via periodic workshops with other agencies and industry representatives.

IMPLEMENTATION SCHEDULE 1989 - 1993

HABITAT PROTECTION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Prevent sedimentation originating from urban development sites by requiring sediment control structures that detain runoff to standards appropriate to the fishery affected.	- District wide as above.	- As above.
- Discourage dredging and channelization where alternate methods of drainage or channel management exist. Where channelization is necessary, ensure that appropriate environmental safeguards are used.	- Conditions of approval under the Lakes and Rivers Improvement Act.	- Liaison with municipalities and construction industry via presentations and workshops.
- Require full sediment control during all construction in or adjacent to water, followed by site rehabilitation immediately following construction.	- As above. Conditions will depend on sensitivity of the fishery.	- As above.
- Adopt a policy to ensure that the issuing of a Licence to Propagate and Sell Bass and Trout is done concurrently with the issuing of a Permit to Take Water and Certificate of Approval by the Ministry of Environment.	- District wide. Frequent liaison with Ministry of Environment.	
- Liaise with municipalities and other agencies to restrict timing of water related development activities (e.g. bridges and culverts, pipelines and cable crossings, channelization) to months that do not coincide with sensitive fish life history periods (e.g. spawning, egg incubation).	- District wide. Provide information to agencies as it becomes available.	- Improve delivery via comput mapping (GIS).
- Review proposals that have the potential to affect groundwater discharge into coldwater streams (e.g. below water table gravel extraction, municipal well proposals).	- Require impact assessment studies and appropriate mitigation.	
- Continue the current policy of refusing authorization to construct dams or on-stream ponds on coldwater streams.	- District wide via review Lakes and Rivers Improvement Act.	

IMPLEMENTATION SCHEDULE 1989 - 1993

HABITAT PROTECTION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
3. Continue to enforce legislation pertaining to protection of fish habitat.		
- Develop a district enforcement plan which gives habitat protection a high priority in the overall work schedule.	- Prepared by district enforcement staff.	
- Ensure district enforcement and fisheries management staff are kept informed of current legislation, policy and protection/mitigation technology.	- Periodic workshops and training sessions.	- Increase level of training.
- Ensure adherence to approval conditions on development applications.	- Develop a monitoring program for works regulated by the Lakes and Rivers Improvement Act (e.g. in-channel works).	- Develop a monitoring program for works regulated by the Planning Act (e.g. subdivisions).
- Provide district enforcement staff with current information regarding locations of development sites which could potentially impact areas with critical fish habitat so that these sites can be monitored regularly during routine enforcement patrols.	- Provide Conservation Officers with lists of locations to check.	- Provide maps with critical habitat and development location via GIS.
- When fish habitat or populations are impacted by human activities, investigate and lay appropriate charges (e.g. Fisheries Act, Game and Fish Act, Lakes and Rivers Improvement Act, etc.). Cooperate with Ministry of Environment to investigate and report spills or fish kills.	- Lay appropriate charges as incidents are encountered.	- Increase level of enforcement activity (e.g. aerial surveys). Requires one additional Conservation Officer.
- Improve effectiveness of the enforcement program through public participation.	- Cooperate with landowners, user groups when encountered.	- Increase level of extension/ education activity to solicit cooperation.

IMPLEMENTATION SCHEDULE 1989 - 1993

HABITAT PROTECTION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
4. Increase public and inter-agency communication to heighten awareness of fish habitat issues.		
- Conduct fisheries awareness workshops with municipal staff and officials. Ensure recognition of the biological and socio-economic advantages of healthy fisheries.	- Periodic meetings to stress fisheries issues.	- Increase level of extens activity.
- Liaise with provincial agencies, municipalities and Conservation Authorities to ensure that sensitive and significant fish habitat is identified and receives adequate protection.	- Provide information via periodic meetings and correspondence.	- As above.
- Provide fish farmers with technical information and advice which will help them optimize use of the groundwater they require to run their operations.	- Provide information on demand.	- Periodic workshops, fiel contact.
- Liaise with municipalities to encourage the maintenance and upkeep of stormwater control structures. Encourage recognition of stormwater as a pollutant that can seriously impair the biological and recreational potential of receiving waters.	- Stress importance during routine correspondence.	- Periodic workshops and presentations.
- Work closely with local Conservation Authorities to ensure that flood control and erosion protection works do not disturb critical fish habitat.	- Stress importance to Conservation Authority staff.	
- Liaise with Ministry of Environment (OMOE) to develop criteria for issuance and enforcement of MOE water taking permits which take into account minimum flows required to sustain fish populations.	- Meet with OMOE staff to stress importance to fisheries objectives.	- Actively work with OMOE develop criteria.

IMPLEMENTATION SCHEDULE 1989 - 1993

STEWARDSHIP AND ETHICS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Educate/inform the public.		
- Prepare a brochure which explains fundamental fisheries management issues such as carrying capacity, fish stocking, and overexploitation. Stress the key role that fish habitat plays in maintaining good fishing.	- Some coverage in annual fisheries newsletter.	- Prepare and distribute a brochure at district office.
- Inform the public of the value and benefit of healthy aquatic ecosystems in providing recreation, economic opportunities, pleasing surroundings and an important environmental indicator.	- Periodic news release. Public presentations on request.	- Increase level of extension activity.
- Educate landowners of the negative effects of small recreation ponds on stream trout populations.	- Periodic news release.	- Include information in brochure explaining fisheries issues (see above).
2. Promote high standards of angler ethics.		
- Advertise examples of good sportsmanship or stewardship.	- Periodic news release.	- Offer an annual award to recognize a deserving individual or group.
- Promote ethical behavior in district publications prepared for anglers.	- Mention in annual newsletter and angler's guide.	- Additional publications as they are prepared.
- Use enforcement as required to combat littering, vandalism, tresspass and waste of the resource.	- As encountered district wide.	- Increase level of enforcement activity.

IMPLEMENTATION SCHEDULE 1989 - 1993

STEWARDSHIP AND ETHICS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
3. Develop programs to improve landowner/angler relations.		
- Encourage anglers to initiate contacts with landowners for access privileges.	- Mention in district fisheries publications and during routine contact.	
- Promote Community Fisheries Involvement (CFIP) and other club projects which improve angler/landowner relations.	- E.g. litter clean-up, trail development. - Promote during routine contact with clubs.	- Initiate a liaison program with outdoor groups (requires additional staff).

IMPLEMENTATION SCHEDULE 1989 - 1993

PUBLIC PARTICIPATION AND EDUCATION

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Educate/inform user groups and the general public.		
- Prepare and distribute a district angling guide which summarizes local fisheries information, including a large scale map. Promote underutilized fishing areas and fish species.	- Distribute via sporting goods stores and district office. Charge fee for bulk orders.	- Increase availability.
- Prepare and distribute a district fisheries news letter which publicizes results of local surveys and projects (e.g. access development, creel survey results, habitat and population assessment and rehabilitation).	- Publish annually.	
- Publicize results of studies on local rare and endangered fish populations.	- Periodic new release. Presentations to local naturalist clubs.	
2. Invite public participation in fisheries management decisions and activities.		
- Establish a forum through which the various users of the fishery resource interact with the ministry to exchange information and ideas on fisheries management issues.	- Questionnaires in annual fisheries newsletter. Peroidic liaison meetings.	
- Seek public involvement before making important fisheries management decisions (e.g. fisheries regulation changes, alteration/removal of dams to allow fish passage, development of Lake Ontario access points).	- Public meetings when required.	
- Encourage voluntary assistance for habitat rehabilition and fish population enhancement projects.	- Via field contact and during public meetings.	
- Encourage organizers of local fishing derbies to collect relevant fisheries information.	- Contact organizers and request cooperation.	

IMPLEMENTION SCHEDULE 1989 - 1993

NATIVE FISHERIES

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Continue to meet with the Six Nations of the Grand River on related fishery resource matters.		
- Encourage members of the Six Nations community to utilize the CFIP and other programs aimed at improving the fishery resources within the watershed.	- Meet to discuss options.	
- Work cooperatively with the Six Nations in defining and documenting the use of fishery resource by members of their community.	- Meet to discuss information needs and action required.	
- Continue discussions with the Six Nations on their interest to develop an Indian Fishing Agreement.	- Ongoing meetings.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SCIENTIFIC AND TECHNICAL KNOWLEDGE

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Implement ongoing inventory and assessment programs to monitor fish populations and habitats.		
- Initiate aquatic habitat inventories (stream, river and lake surveys) on unsurveyed waters. Resurvey waters as required.	- Guelph Lake - Belwood Lake - Valens Reservoir - Binbrook Reservoir - Fairchild Creek - Blue Lake Creek - Mount Pleasant Creek - Irvine Creek	- Mountsberg Reservoir - Kelso Reservoir - Conestogo River - Nith River - Speed River - Hanlon Creek - McKenzie Creek - Boston Creek - Conestogo Lake - Christie Reservoir
- Establish an index station program which samples representative sites on selected rivers, streams and lakes to monitor species composition, abundance levels and habitat quality. Monitor each station for a minimum of three years.	- Population estimates via backpack, shore or drift boat electrofisher. - Whitemans Creek (4 sites) - Bronte Creek (3 sites) - Nith River (3 sites) - Conestogo River (3 sites) - Speed River (2 sites) - Mill Creek (3 sites) - West Credit River (3 sites) - Grand River (3 sites)	- Oakville Creek (3 sites) - Eramosa River (3 sites) - Black Creek (3 sites) - Hanlon Creek (2 sites) - Blue Springs Creek (2 sites) - Bells Creek (2 sites) - Grindstone Creek (2 sites) - Spencer Creek (3 sites)
- Determine productivity and allowable yield estimates for district baitfish populations by implementing suitable population and habitat studies (estimates of harvestable area, index stations, harvest simulation).		- Representative sites to be determined after consulting with industry representatives.
- Support studies on district waters of Lake Ontario conducted by the Lake Ontario Fisheries Unit (LOFU).	- Provide assistance when staff availability permits.	- Assist in design and implementation of projects.

IMPLEMENTATION SCHEDULE 1989 - 1993

SCIENTIFIC AND TECHNICAL KNOWLEDGE

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Conduct aerial surveys of important fisheries to assess habitat. Record with video camera for use in plan input and review, and habitat protection.	- Grand River (Belwood-Caledonia) - Speed River - Nith River - Whitemans Creek - Mill Creek	- Conestoga River - West Credit River - Eramosa River - Bronte Creek
- Conduct surveys of known populations of rare fish to determine abundance and habitat quality. Sample areas that contain similar habitat.		- Could be implemented with assistance from Conservation Authorities and naturalist clubs.
- Conduct temperature studies on selected coldwater streams to assess their present suitability for trout and potential for rehabilitation.	- Summer max-min thermometer stations on the following streams: - West Credit River - Mill Creek - Bronte Creek - Speed River - Spencer Creek - Eramosa River - Swan Creek - Carroll Creek - Grand River (Fergus-West Montrose)	- Hanlon Creek - Black Creek - Mount Pleasant Creek - Bells Creek - Grindstone Creek - Oakville Creek - Alder Creek
- Assess fish stocking programs by conducting creel survey and fish population estimate studies.	- Bronte Creek (migratory salmonids) - Puslinch Tract (rainbow trout) - Upper Grand River (brown trout) - Conestogo River (trout, walleye) - Guelph Lake (walleye) - Mid Grand River (walleye)	- Other stocked waters as required.

IMPLEMENTATION SCHEDULE 1989 - 1993

SCIENTIFIC AND TECHNICAL KNOWLEDGE

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Sample fish communities at representative sites to determine distribution and range of gamefish species.	- Welland River - Oakville Creek - Alder Creek - Mount Pleasant Creek - Blue Lake Creek	- Eramosa River - Conestogo River - Fairchild Creek - Spencer Creek - Nith River - Speed River - Twenty Mile Creek - Forty Mile Creek - Bells Creek - Bechtel Creek - Strasburg Creek - Canagagigue Creek - Carroll Creek - Swan Creek - Laurel Creek - Sulphur Creek - Washington Creek - Bamberg Creek
- Conduct spawning surveys on coldwater streams to monitor adult abundance and identify critical spawning areas. Monitor each stream for at least three years.	- Whitemans Creek - Mill Creek - Bronte Creek (above Lowville) - Eramosa River - Upper Speed River	- Other streams with public volunteer assistance.
2. Determine reliable estimates of resource use.		
- Develop and regularly conduct creel survey studies on representative inland waters to monitor demand and exploitation rates.	- Whitemans Creek - Guelph Lake - Bellwood Lake - Valens Reservoir - Bronte Creek	- Bannister-Wrigley Lakes - Mountsberg Reservoir - Binbrook Reservoir

IMPLEMENTATION SCHEDULE 1989 - 1993

SCIENTIFIC AND TECHNICAL KNOWLEDGE

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Support efforts by the LOFU to conduct regular creel survey programs to monitor the boat and shoreline fishery of Lake Ontario's western basin.	- Provide LOFU with list of suspected high use areas.	- Assist in conducting shoreline survey.
- Monitor selected or representative fishing derbies and tournaments to determine impacts or contributions to overall fishing pressure and harvest.	- Grand River Bass Derby - Belwood Lions Derby	
- Work with the commercial bait fishing industry to improve the accuracy and usefulness of the mandatory annual harvest reports filled out by licenced operators.	- Meet with industry representatives.	
- Compare and refine estimates of resource use, resource potential and fisheries targets as more accurate information becomes available.	- Periodic review.	
3. Encourage and facilitate information collected by other agencies.		
- Work closely with local Conservation Authorities to review work programs and exchange relevant fisheries data to avoid duplication in ongoing studies.	- Meet regularly with Conservation Authority staff.	
- Encourage researchers at local universities to study topics relevant to local fisheries management (e.g. baitfish productivity and allowable yield, groundwater withdrawal effects on coldwater fisheries).	- Correspondence to department heads.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - COLDWATER STREAMS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Rehabilitate degraded trout habitat.		
- Use stream survey and assessment data to identify streams with good potential for restoration. Prepare individual work plans to specify the type of restoration required for each stream.	- Depends on results of data review (see also Appendix 1). Tentative List: - West Credit River - Mill Creek - Hanlon Creek - Eramosa River - Whitemans Creek - Spencer Creek	- Bronte Creek (above Lowville) - Oakville Creek (above Milton) - Black Creek / Silver Creek - Blue Springs Creek - Bells Creek - Cedar Creek - Grindstone Creek (above Waterdown)
- Undertake habitat improvement and creation on the above streams via public involvement (Community Fisheries Involvement Program - CFIP) and district fisheries work programs.	- Tentative list as above.	- As above.
- Reduce impacts of cattle trampling on trout streams by providing landowners with assistance to erect streamside fencing.	- Whitemans Creek - Mill Creek - Black Creek	- Nith River - Bells Creek - Alder Creek - Swan Creek - Washington Creek
- Initiate a dam removal/modification program on coldwater streams. Obtain landowner permission and cooperation prior to implementation. Ensure maintenance of existing barriers to sea lamprey migration.	- Eramosa River	- West Credit River - Limestone Creek - Oakville Creek - South Saugeen River - Speed River - Bronte Creek (above Lowville)

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - COLDWATER STREAMS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Promote and facilitate reforestation of headwater areas and erosion prone land.	- In cooperation with other agencies, concentrate on watersheds with significant potential for improvement.	- Include watersheds of secondary fisheries importance.
2. Protect sensitive wild trout populations.		
- Construct or maintain barriers to selectively restrict migratory salmonids from stream sections that support sensitive resident trout populations. Public and inter-agency consultation will be required prior to construction of new barriers.	- Whitemans Creek (new barrier) - Bronte Creek (maintenance of Lowville Dam)	
- Adopt a policy of not issuing a Licence to Propagate and Sell Bass and Trout to prospective fish farmers who wish to establish their operation at a location that is likely to impact wild trout populations.	- Review on a case by case basis.	
- Ensure that OMNR Fish Transfer Permits are obtained for all fish stocking by the private sector. Compliance will reduce the risk of introduced fish species competing with wild stocks.	- Review all permits.	
3. Expand opportunities to fish for trout in inland waters.		
- Encourage and facilitate angling in stocked trout ponds to satisfy demand for trout fishing opportunities yet reduce pressure on heavily fished streams.	- See Page 74.	
- Stock appropriate rivers and streams with hatchery reared rainbow trout to provide additional angling opportunities. Monitor effectiveness via periodic creel surveys.	- Grand River (below Belwood Dam) - Conestogo River (below Conestogo Dam)	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - COLDWATER STREAMS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Investigate feasibility of introducing brown trout fry or fingerlings from wild stock into selected rivers and streams in order to establish new self sustaining trout fisheries.	- Grand River (Fergus-Inverhaugh) - Swan Creek - Carroll Creek	- Alder Creek (below New Dundee) - Speed River (above Speedside) - Mount Pleasant Creek
- Implement special harvest and gear restrictions (i.e. reduced bag limit with size and tackle restrictions) on a 2 km long section of Whitemans Creek on an experimental basis to determine effectiveness in increasing recreation from a limited resource base. Assess effectiveness of regulations in a scientific manner.	- Apps Mill Nature Centre. Artificial lures only.	
- Encourage and facilitate attempts by angling clubs to develop public access to streams on private land through landowner agreement.	- Provide assistance on request.	
- Investigate the feasibility of incentives, easements or aquisition to provide public access to important trout fisheries that presently have limited access.	- Approach landowners as the opportunity presents itself.	- Conduct investigation and recommend course of action.
- Support acquisition programs by other agencies (e.g. Conservation Authorities) which would result in increased fishing opportunities or habitat protection. Provide these agencies with a priority list of sites.	- Liaison to discuss options and priorities.	
4. Minimize illegal harvest of resident trout.		
- Enforce existing legislation and prosecute individuals taking trout illegally.	- District wide.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - COLDWATER STREAMS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Recommend creation of new fish sanctuaries in areas where trout are vulnerable and illegal harvest is a major problem.	- Whitemans Creek (Oct 1 - last Saturday in April)	
- Develop a district enforcement work plan which priority rates enforcement efforts to concentrate on problem areas.	- Prepared by district enforcement staff.	
- Increase liaison with the Ontario Federation of Anglers and Hunters (OFAH), sportsmans clubs and landowners to report violations.	- During routine contact and at liaison meetings. Provide briefing on information which would assist enforcement.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - WARMWATER AND COOLWATER RIVERS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Rehabilitate degraded habitat, create additional habitat.		
- Work with Ministry of Environment (OMOE) and municipalities to reduce nutrient input from municipal sewage effluent.	- Concentrate on areas where fish populations may be limited by poor water quality. - Speed River (below Guelph) - Grand River (below Cambridge)	
- Encourage and facilitate the application of innovative fish habitat creation and enhancement techniques when reviewing development proposals adjacent to large streams or rivers. Examples include creation of shoreline diversity and spawning habitat during final grading of floodplain gravel extraction pits or riverside residential lots.	- Via routine plan review.	- Meetings with developers to solicit cooperation.
- Encourage Conservation Authorities to incorporate fish habitat improvements in major erosion or flood control engineering works.	- Provide technical and financial assistance when appropriate.	
- Work with other agencies (Conservation Authorities, OMAF) to promote soil conservation and stewardship toward the fishery resource to farmers and landowners.	- Meetings and field visits.	- Increase level of liaison activity.
2. Increase availability of preferred fish species.		
- Extend the range of Grand River walleye upstream over barriers to migration by initiating ripe adult transfers and jar/pond culture and fingerling stocking.	- Utilize CFIP assistance whereever possible. - Concentrate on areas with greatest potential (e.g. Conestogo River).	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - WARMWATER AND COOLWATER RIVERS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Encourage and facilitate where possible the construction of fish passage facilities over dams in the Grand River watershed that restrict access of sportfish (especially walleye) to suitable spawning and rearing habitat.	- Provide financial assistance where appropriate. - New Hamburg Dam (Nith River)	- Lorne Dam (Grand River) - Paris Dam (Grand River)
- Support the construction of launching ramp facilities to encourage use of deep, slow portions of the Grand River by boat anglers.	- Brantford and Caledonia areas.	
- Promote underutilized fishing areas via news release and mention in district angling guide.	- Include a large scale map in angling guide.	- Promotional videos.
3. Increase fishing activity for underutilized fish species.		
- Work with municipalities developing riverside parks to incorporate facilities which enhance angling opportunities (e.g. wheelchair access, benches and docks, interpretive displays, signs to direct anglers to good locations).	- Encourage municipalities developing riverside parks to provide facilities.	- Provide financial assistance where cost effective.
- Promote underutilized species in a district angling guide and during extension contracts.	- Angling guide and during routine contacts with anglers.	
- Support fishing derbies for underutilized fish species by having OMNR staff present at check stations and official ceremonies.	- Brantford carp derby.	
4. Reduce illegal harvest.		
- Develop a district enforcement work plan which organizes enforcement efforts to concentrate on problem areas.	- Prepared by district enforcement staff.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - WARMWATER AND COOLWATER RIVERS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Recommend creation of new fish sanctuaries in areas where fish are vulnerable and illegal harvest is affecting sportfish populations.	- Grand River (Apr 1 - mid May to protect walleye in Brantford area).	
- Increase liaison with Ontario Federation of Anglers and Hunters (OFAH), sportman's clubs and landowners to report violations.	- Provide advice on information to collect if witnessing a violation.	
5. Examine the technical feasibility, biological impacts and cost effectiveness of establishing a migratory salmonid fishery in the Grand River. Further management action will be based on the findings and recommendations of this study.		
- Consult with all appropriate agencies and jurisdictions (Lake Erie Management Committee, Lake Erie Fisheries Unit, Niagara District, Grand River Conservation Authority) to examine biological and socio-economic impacts and consistency with existing management objectives for Lake Erie and the Grand River. Examine implications of various management scenarios (e.g. stock both rainbow trout and Pacific salmon vs. trout only, stock at various densities, creation of new fishways vs. use of existing fishways only).	- Meet to discuss implications and options.	
- Contact agencies that presently maintain artificial migratory salmonid fisheries on warmwater rivers (e.g. Grand and St. Joseph Rivers in Lake Michigan watershed) to examine the technical and financial requirements and cost effectiveness of this type of fishery.	- Obtain technical information from fisheries staff.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - WARMWATER AND COOLWATER RIVERS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Utilize information collected through implementation of the above tactics to estimate the cost, benefits and consequences of various migratory salmonid management scenarios for the Grand River.	- Utilize information collected through above tactics.	
- Summarize information in a report which makes detailed recommendations for management action. Implement recommendations following public consultation.	- Depends on results of above tactics. Actual management action will be specified in 1994 - 1998 Implementation Schedule.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - INLAND LAKES AND RESERVOIRS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Improve fish habitat and water quality in inland waterbodies.		
- Work with Conservation Authorities to identify and assess fish habitat and angling potential in inland lakes and reservoirs. Develop rehabilition work plans.	- Belwood Lake - Guelph Lake - Valens Reservoir - Mountsberg Reservoir	- Conestogo Reservoir - Binbrook Reservoir - Christie Reservoir - Damascus Reservoir
- Initiate habitat improvement and creation projects on the above waterbodies (e.g. artificial reefs, spawning bed creation) via public involvement (e.g. CFIP) and district fisheries work program.	- As above.	- As above.
- Cooperate with Conservation Authorities and other government agencies (Ministry of Agriculture and Food, Ministry of Environment) to reduce nutrient and sediment loading in reservoirs (e.g. Rural Beaches Program).	- Meet to discuss priorities and options.	
- Cooperate with efforts by the Ministry of Environment and Puslinch Lake Cottage Owners Association to develop and implement a Remedial Action Plan to restore water quality and recreation potential in Puslinch Lake.	- Provide assistance via CFIP to initiate structural improvements (e.g. spawning bed creation, artificial reefs).	
2. Work with Conservation Authorities to reduce negative impacts of seasonal water level fluctuation in water management reservoirs.		
- Determine the feasibility of modifying reservoir management criteria to incorporate fisheries concerns (e.g. minimum standards for winter pool volume, water level maintenance during egg incubation periods of important fish species).	- Meet to investigate options.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - INLAND LAKES AND RESERVOIRS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Investigate feasibility of structural enhancement which would mitigate impacts of water draw down (e.g. dykes and levees to create spawning and nursery embayments).	- Belwood Lake - Conestogo Lake - Guelph Lake	
3. Improve access and fishing conditions in warmwater lakes and reservoirs.		
- Provide assistance to Conservation Authorities to construct launching ramps, fishing piers, wheelchair access and fish cleaning stations.	- Bannister-Wrigley Lake - Belwood Lake	- Valens Lake - Binbrook Lake - Guelph Lake
- Mark selected natural and artificial reefs and structure with bouys so that they can be easily located and effectively fished by anglers.	- Belwood Lake - Guelph Lake	
- Provide municipalities with information and assistance to enhance angling opportunities in small ponds under their jurisdicion.	- Provide information on request. - Prepare a generic information package and send to each municipality.	
- Collect biological data to determine if sportfish populations are being overharvested at popular inland waterbodies. Use data to examine if changes in regulations would improve angling quality. Implement appropriate regulations (e.g. size or catch limits, seasons) on an experimental basis if biological justification exists.	- Belwood Lake (pike)	- Mountsberg Lake (bass) - Valens Lake (bass)

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - INLAND LAKES AND RESERVOIRS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Introduce selected fish species (e.g. walleye, black crappie, channel catfish) into suitable waterbodies that presently lack fish species desired by anglers. Introductions must be preceded by detailed habitat and population assessment to ensure project success and avoid negative impacts to adjacent fisheries.	- Belwood Lake (crappie, walleye) - Guelph Lake (walleye, channel catfish) - Conestogo Lake (channel catfish) - Luther Lake (largemouth bass)	
4. Promote underutilized fishing opportunities in inland lakes and reservoirs.		
- Describe and encourage angling in underutilized waterbodies via news release and a district angling guide. Stress areas which provide excellent opportunities for children (i.e. lakes containing abundant panfish).	- Provide maps in district anglers guide.	
- Encourage local Conservation Authorities and municipalities to promote angling opportunities and advertise locations and fishing conditions in lakes, ponds and reservoirs in their jurisdiction.	- Provide information to assist in preparation.	
- Support fishing derbies for panfish and coarse fish species. Encourage the harvest of all fish caught.	- Presence of OMNR staff at weigh station and awards presentations.	
5. Provide coldwater fishing opportunities by creating artificial "put and take" fisheries in selected waters to satisfy demand and divert pressure from resident trout populations.		
- Purchase disease free trout from private fish farms to stock in suitable public ponds. Assess effectiveness via periodic creel surveys.	- Puslinch Crown Resource Management Area - Fifty Point Conservation Area - Christie Conservation Area	- Stock additional locations if they are found to be suitable.

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - INLAND LAKES AND RESERVOIRS

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Encourage the private sector to provide artificial fisheries based on the "user pays" concept.	- Provide technical assistance to prospective operators.	
- Advertise locations of fishing areas that are sustained by stocking programs.	- Mention in district anglers guide.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Maintain a mix of wild and stocked salmonid species that satisfies angler demand, yet can be supported by the forage base.		
- Do not eliminate planting of any species currently stocked in district waters of Lake Ontario.	- Manage for existing fish community.	
- The numbers of each species stocked may change, but the total stocking effort will not exceed current levels unless new information concerning forage base limitations indicates otherwise.	- Consult with LOFU and Regional Office.	
- Support studies by the Lake Ontario Fisheries Unit (LOFU) to monitor forage fish population levels and migratory salmonid diet and growth rates to determine if predation is depressing the forage base.	- Review studies and provide input.	
- Monitor angler species preferences through surveys and consultation with representatives from local angling clubs.	- Questionnaire in annual fisheries newsletter.	
- For each species, reduce stocking levels at the same rate that natural reproduction levels increase due to habitat rehabilitation. This will maintain the forage base at present levels.	- Result will be maintenance of fishable population at existing levels.	
- Stock lake trout juveniles at locations with potential spawning habitat.	- Fifty Point Reef	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Stock coho salmon in Bronte Creek to sustain a fall stream/harbour fishery and diversify the open water fishery.	- Yearling and fall fingerling stocking (Lowville to mouth)	
- Stock chinook salmon at locations and at densities that will maximize utilization by anglers, yet minimize problems caused by large numbers of spawning fish in confined areas.	- Burlington Pier - Bronte Creek (Lowville to mouth)	
2. Maximize rainbow trout natural reproduction.		
- Evaluate the capability of candidate streams to produce trout by conducting detailed habitat assessment.	- Review existing assessment data. Collect additional data as needed. - Bronte Creek - Limestone Creek - Oakville Creek	- Grindstone Creek - Spencer Creek
- Conduct fish population estimates at index stations on selected streams to assess stocking and/or determine reproductive success.	- Bronte Creek - Limestone Creek	- Grindstone Creek - Oakville Creek - Spencer Creek
- Stock hatchery reared yearlings of wild stock at sites with potential spawning and nursery habitat.	- Bronte Creek - Stocking at additional locations depends on results of above tactics.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Repair degraded trout habitat by preparing work plans, then performing the required rehabilitation through community involvement or district fisheries work programs.	- Limestone Creek - Bronte Creek	- Grindstone Creek - Oakville Creek
3. Facilitate the re-introduction of a self-sustaining Atlantic salmon population in the Credit River watershed.		
- Cooperate with OMNR Fisheries Research Section, Maple District and the Credit Valley Conservation Authority to implement aspects of the Atlantic Salmon Experimental Management Plan pertaining to portions of the Credit River watershed lying in the Cambridge District.	- Credit River watershed upstream of Norval.	
- Assist Fisheries Research staff conducting fish population and habitat assessment studies to monitor the salmon population and identify critical production and rearing sites.	- As other priorities permit.	
- Establish a priority system for habitat rehabilitation projects which will enhance salmon production and migration.	- Develop in conjunction with Maple District and Credit Valley Conservation Authority.	
- Facilitate adult Atlantic salmon passage over existing dams on the Credit River that are located in Cambridge District.	- Julian Reed Dam - Norval - Glen Williams Dam	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Investigate benefits and consequences of allowing Atlantic salmon migration over existing man-made barriers on Black and Rogers Creeks in order to increase available spawning and nursery habitat. Invite public input.	- Must evaluate impacts to existing brook trout fisheries.	
- Establish new angling regulations (size limits, closed seasons and/or sancturaries as specified in the Atlantic Salmon Experimental Management Plan) which will protect adults and juveniles from overharvest. These regulations may be changed once the population becomes established.	- Must be consistent with regulations in Maple District.	
4. Improve access to Lake Ontario for boat anglers.		
- Work with municipalities and Conservation Authorities to upgrade existing and create additional boat launching/ trailer parking facilities at suitable public areas along the Lake Ontario shoreline. Provide financial assistance where appropriate.		- Spencer Smith Park (Burlington) - 50 Point Conservation Area (Stoney Creek) - Bronte Harbour
5. Expand angling opportunities in tributaries and along the Lake Ontario shoreline.		
- Recommend modification of angling regulations to establish an extended fall angling (to Dec 31) zone for rainbow and brown trout on lower Bronte Creek (Rebecca Street to Highway 5).	- Would create additional recreation without biological impacts.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Consult with municipality, user groups and local property owners to determine the feasibility of elimination the Rebecca Street to Lakeshore Road fish sanctuary on lower Bronte Creek.	- Meetings to solicit cooperation.	
- Encourage municipalities, Conservation Authorities and private corporations who own shoreline property to assist in the provision of facilities for shoreline anglers (e.g. handicapped angler access, small pier construction, shoreline habitat creation).	- Spencer Smith Park (Burlington) - 50 Point Conservation Area - Bronte Harbour - Centennial Park	
- Stock brown trout at locations that will result in the maintenance of a rivermouth and shoreline fishery through much of the angling season.	- Fifty Point - Burlington Pier - Spencer Smith Park - Bronte Harbour - Oakville Harbour	
6. Reduce the impact of contaminants on aquatic communities.		
- Work cooperatively with other agencies to reduce nutrient, sediment and toxic substance inputs into all district watercourses.	- District wide.	
- Assist Ministry of Environment with the collection of fish samples for contaminants analysis.	- Collect during spawning migrations.	
- Continue to provide information to the public regarding consumption guidelines.	- Distribute Guide to Eating Fish from district office. Provide information on request.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
7. Identify locations which presently or potentially support warmwater and coolwater fish habitat or fishing opportunities.		
- Solicit information regarding past or present spawning and nursery areas and good fishing locations from bait fishermen, angling clubs and charter boat operators.	- During routine contact (field, meetings, presentations).	- Request information via questionnaire.
- Work with the LOFU to survey the Lake Ontario shoreline and document critical habitat areas.	- Assist LOFU when other duties permit.	
8. Improve warmwater and coolwater fish habitat in Lake Ontario.		
- Determine the feasibility of repairing degraded spawning or nursery habitat via site assessment and consultation with LOFU.		- Site assessment in consultation with LOFU.
- Where habitat restoration or creation is feasible, prepare a work plan and perform the required rehabilitation.		- Depends on results of above tactic.
9. Cooperate with other agencies to rehabilitate the warmwater/ coolwater fish community in Hamilton Harbour.		
- Continue involvement with other agencies and interest groups to develop a Remedial Action Plan (RAP) to restore the Hamilton Harbour/Cootes Paradise system as a viable and productive aquatic ecosystem.	- Participate as member of writing team.	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Facilitate implementation of structural habitat improvements which will restore the warmwater fish community as outlined in the RAP.		- Provide financial assistance if cost effective.
- Assist in a northern pike re-introduction program via adult fish transfers.	- Implemented via CFIP.	
10. Minimize illegal or inappropriate harvest of migratory salmonids.		
- Do not issue commercial (food) fishing licences for Cambridge District waters of Lake Ontario.	- Maintain status quo.	
- Increase Conservation Officer boat patrols on Lake Ontario to police the open water sport fishery.	- Purchase enforcement boat.	
- Develop a district enforcement work plan which organizes enforcement efforts to concentrate on problem times and areas (e.g. salmon concentrations in tributaries, rainbow trout spawning).	- Prepared by district enforcement staff.	
- Recommend creation of fall and/or winter fish sanctuaries in areas where trout and salmon are vulnerable and illegal harvest is a major problem.	- Bronte Creek (Lowville - Highway 5 - Oct 1 to last Saturday in April) - Bronte Creek (Highway 5 - Rebecca St - Jan 1 to last Saturday in April) - Grindstone Creek (as above)	

IMPLEMENTATION SCHEDULE 1989 - 1993

SPORTFISH MANAGEMENT - LAKE ONTARIO

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Increase liaison with the Ontario Federation of Anglers and Hunters (OFAH), sportmens clubs and landowners to report violations.	- Provide advice regarding information required as witness to violation.	
11. Control sea lamprey predation.		
- Assist the Sea Lamprey Control Centre (Department of Fisheries and Oceans) to monitor sea lamprey abundance.	- Provide information collected coincidentally while conducting fisheries surveys.	
- Facilitate the efforts of the Sea Lamprey Control Centre to reduce sea lamprey numbers in local streams.	- Provide information and ensure consistency with Sea Lamprey Control Centre objectives when modifying dams.	
12. Promote fishing opportunities in Lake Ontario.		
- Promote spring smelt fishing via news release and description in a district angling guide.	- Provide map of best locations.	
- Encourage and assist local Conservation Authorities and municipalities to promote Lake Ontario angling.	- Provide information on request. Promote during liaison meetings.	
- Describe Lake Ontario angling opportunities in a district angling guide.	- Provide map of best locations and access points.	

IMPLEMENTATION SCHEDULE 1989 - 1993

BAITFISH MANAGEMENT

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Protect and maintain existing baitfish populations.		
- Enforce existing provincial regulations which govern the capture and sale of baitfish.	- Throughout district.	
- Limit entry into the commercial fishery by refusing to issue new licences. Continue this policy until more comprehensive assessment information indicates that the resource is capable of sustaining additional harvest pressure.	- Throughout district.	
- Inform commercial harvesters and dealers of all requirements relating to the baitfish industry as set out in legislation.	- Periodic workshops.	
- Develop a communications package to advise anglers of all legislation related to the harvest of baitfish for personal use.	- Distribute package from District office.	
- Prevent the introduction of competitive fish species or the spread of disease by enforcing pertinent regulations.	- Throughout district.	
2. Work with the baitfish industry to develop a comprehensive baitfish management program.		
- Encourage the establishment of a local (district) baitfish management council comprised of representative harvesters and dealers.	- Promote advantages during periodic meetings.	

IMPLEMENTATION SCHEDULE 1989 - 1993

BAITFISH MANAGEMENT

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
- Conduct periodic meetings and workshops to discuss current problems and alternatives for their resolution. Invite participation of all harvesters and dealers, as well as those on the harvest licence waiting list.	- Solicit feedback via questionnaires and informal dialogue.	
- Investigate alternatives to the present harvest licencing and zone system which would maximize utilization of existing stocks, yet minimize competition and overharvest (some alternatives include zone boundary changes, institution of an exclusive use block system, creation of Lake Ontario zones or some combination of these).	- Consult with industry to determine preferred alternative.	
- Maintain and annually update a waiting list for baitfish harvest licences. Issue new licences from this list only when available biological information indicates that increased harvest is allowable.		
- Work with industry representatives to evaluate and improve the accuracy and usefulness of the existing annual harvest reports that are filled out by harvesters as a condition of licence renewal.	- Periodic meetings.	
- If improved harvest or potential yield estimates indicate that the current estimates are inaccurate, initiate revisions to the DLUG and Fisheries Plan targets for baitfish management.	- Depends on results of above tactics.	

IMPLEMENTATION SCHEDULE 1989 - 1993

BAITFISH MANAGEMENT

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
3. Ensure a consistent supply of baitfish to local dealers and anglers.		
- Facilitate private culture and sale of baitfish species in order to decrease pressure on wild populations and supplement existing supply. Provide technical advice and encourage financial incentives at the provincial level.	- Provide technical advice on request.	- Conduct workshops.
- Consider introduction of suitable baitfish species to new areas if it can be determined that the introduction will be compatible with other fish species.	- Investigate on a case by case basis.	
- Work with a local baitfish council to establish a communication and distribution system that will ensure local dealers have access to baitfish during peak demand and supply shortage periods.		- Work with industry.
- Develop a set of minimum standards for baitfish holding and transport facilities (tanks, aerators, water supply) to reduce waste through mortality. Enforce standards as a condition of licence renewal.	- Collect information from other districts and develop standards.	
- Provide harvesters and dealers with technical information and advice to reduce mortality due to handling and holding facilities.	- Provide information on request.	- Conduct workshops.

IMPLEMENTATION SCHEDULE 1989 - 1993

BAITFISH MANAGEMENT

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
4. Develop a comprehensive baitfish assessment program.		
- Estimate productivity and allowable baitfish yields for local waters by implementing population and habitat studies at representative locations.		- Representative sites throughout district.
- Identify critical areas of baitfish habitat and harvest potential through habitat mapping and communication with commercial harvesters.		- Use information collected from harvesters, as well as results of above tactic.

IMPLEMENTATION SCHEDULE 1989 - 1993

PROVINCIAL RARE AND ENDANGERED FISH SPECIES MANAGEMENT

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Identify and monitor populations of rare or endangered fish species.		
- Repeat inventories of aquatic habitat on all district streams as required so that information on fish populations is as current as possible. Most populations of rare or endangered fish are discovered while performing routine survey or assessment duties.	- Done coincidentally with routine surveys.	
- Conduct surveys of known populations of rare fish to determine abundance and habitat quality. Sample areas that contain similar habitat.		- Mid reaches of Grand River (river redhorse, black redhorse, silver shiner) - Nith River (black redhorse, silver shiner) - Bronte Creek (silver shiner, redside dace) - Irvine Creek (redside dace) - Lake Ontario tributaries Hamilton to Oakville (redside dace)
- Prepare status reports on each rare and endangered fish species found in the district.		- Collect information and write reports.
- Support the efforts of other organizations such as COSEWIC and The Royal Ontario Museum that are investigating the status of rare and endangered fish species.	- Notify appropriate staff of any new collection.	

IMPLEMENTATION SCHEDULE 1989 - 1993

PROVINCIAL RARE AND ENDANGERED SPECIES

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
2. Protect rare fish populations and their habitat.		
- Continue to enforce existing legislation that protects fish habitat, especially that known to support rare fish populations.	- Throughout district.	
- Ensure that this habitat is recognized and protected when reviewing development proposals.	- Throughout district.	
3. Keep the public informed of the status of rare and endangered fish species.		
- Publicize the results of status reports on rare fish species.	- News release, presentations to interested groups.	
- Support public awareness and research efforts by other agencies and organizations.	- Provide information from district files.	
4. Solicit the cooperation of local bait fishermen to locate and protect populations of rare and endangered fish species.		
- Provide baitfish harvesters with information which will help them recognize rare or endangered species they could possibly encounter. Solicit their cooperation in identifying new populations.	- Circulate information to harvesters.	
- Solicit baitfish harvesters cooperation in reducing incidental harvest of rare or endangered fish species.	- As above.	

IMPLEMENTATION SCHEDULE 1989 - 1993

NON-CONSUMPTIVE FISHERIES

STRATEGIES AND ASSOCIATED TACTICS	PRIORITY LIST OF SITES OR ACTIVITIES	
	AT EXISTING FUNDING	WITH ADDITIONAL FUNDING
1. Promote and enhance opportunities for fish viewing.		
- Publicize the best locations and times to view fish migrations or spawning activities via news release and information brochures.	- News release.	- Information brochures.
- Install displays at selected fish viewing areas to improve public knowledge of that resource.	- Apps Mill Nature Centre (Whitemans Creek)	- Lowville Park (Bronte Creek) - Kelso Conservation Area (Oakville Creek)
- Invite organized groups to participate in projects that involve fish handling or collection (e.g. fish transfers, egg collection, population assessment).	- Implemented in conjunction with with CFIP projects.	
- Facilitate attempts to improve public access to areas with fish viewing potential that are located on private property.	- Dams on Bronte Creek, Credit River. Approach landowners and solicit cooperation.	

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GLOSSARY

Angler-Day

A measure of fishing effort or activity which is equivalent to four angler-hours. This is based on the assumption that the average fishing trip is approximately four hours. One angler-day is considered to be one angler opportunity.

Angler-Hour

A measure of fishing effort or activity and represents one hour of active fishing by one angler.

Artificial Fishery

A fishery which is maintained entirely through plantings of hatchery reared fish in order to provide angling opportunities.

Bait Fish

Any fish that are legally harvested by the commercial bait fish industry.

Coldwater Streams

Those streams having characteristics which would support trout or salmon.

Commercial Fish

Any fish that are legally harvested by the commercial fishing industry.

Coolwater Fish Community

Fish populations composed primarily of the families Escocidae and Percidae. This includes northern pike, yellow perch and walleye.

Current Use

A measure of use of the fish resources by key users (e.g. anglers, commercial fishermen, bait harvesters, etc.) and presented as angler-days of fishing effort and kilograms of fish harvested for the sport fishery, kilograms of fish harvested for the commercial fishery and dozens of baitfish harvested by the bait fishery.

Current Yield

The current yield represents the estimated potential yield at the present time under the present conditions.

Fish Community

A combination of different fish species living and interacting together in the same body of water.

Goal

A general purpose to which the Ministry aspires.

Management

The judicious use of means to achieve ends. Management may have various levels of intensity.

Objective

A quantifiable and attainable end, which the Ministry's efforts are intended to accomplish.

Opportunity

A measure of recreation supply which is used to describe the number of times a resource or facility can be used in a given time period. An opportunity is considered not to be greater than one day.

Pacific Salmon

Pacific salmon includes coho salmon, chinook salmon, kokanee salmon, pink salmon and any member of the genus Onchorhynchus.

Potential Yield

The total amount of fish flesh (all species of interest) that can be removed annually from the water without exhausting the ability of the fish community to sustain itself.

Projected Use

The level of fishing effort (angler-days) and/or fish harvested (kg or dozen) that is expected to occur by the year 2000.

Projected Yield

The projected yield represents the estimated potential fisheries yield at the year 2000 and is based upon changes in fish stocks as well as realizing a proportion of the potential yield from waters currently rated as under-producing.

Rehabilitation

This term may be applied to both fish populations and fisheries habitat. In both instances, rehabilitation denotes efforts to enhance or restore a degraded or stressed situation to its original condition.

Resource Management

The wise use of a particular resource such as fish to achieve a specific end.

Salmonid

Fish that are members of the Family Salmonidae (trout and salmon).

Sportfish

Any fish that are legally caught by angling.

Strategy

Planned actions or measures to achieve a desired end.

Tactic

A method devised to achieve one or more strategies.

Target

A quantified end to be achieved or completed by a specific date.

Underproducing Waters

Waters from which fish production is less than potential because of habitat or water quality deterioration, overharvest or absence of desirable species.

Warmwater Fish Community

Fish populations composed primarily of the families Centrarchidae, Ictaluridae and Cyprinidae. This includes smallmouth, largemouth and rock bass, sunfish, crappie, bullhead, carp and minnow species.

APPENDICES

The following appendices specify fish community types and management requirements for inland fisheries located in Cambridge District. It is important to note that identification of action required for specific sites does not imply implementation over the next five years. The primary purpose of these appendices is to provide fisheries information at the site specific level and to stimulate public interest and participation in rehabilitation projects through the Community Fisheries Involvement Program (CFIP).

Appendix I: SPORT FISHERIES MANAGEMENT DESIGNATION FOR COLDWATER STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2FC-3	Bells Creek	All	Resident book trout	Some habitat rehabilition required (dam modification/removal). Investigate for management potential.
2GA-1	Grand River	Belwood Dam to Inverhaugh	Transitional coolwater/ coldwater	Temperatures suitable for trout due to Belwood Dam discharge. Stock hatchery reared rainbow trout to provide immediate angling opportunities. Consider brown trout introduction.
	Bechtel Creek	All	Resident brook trout	Protect habitat from urban development impacts.
	Bowman Creek	All	Resident brook trout	Protect habitat from urban development impacts.
	Strasburg Creek	All	Resident brook trout	Severely degraded (sedimentation and stormwater from urban development). Protect habitat from further impacts.
	Canagagigue Creek	Above Floradale	Resident brook trout	Investigate for rehabilitation potential. Trout population may no longer be present.
	Carroll Creek	Headwaters	Resident brook trout	Investigate for rehabilitation potential. Trout population may no longer be present. Consider brown trout introduction.
	Swan Creek	All	Resident brook trout	Investigate for rehabilitation potential. Consider brown trout introduction below Highway 6.
	Laurel Creek	Above Erbsville	Resident brown and brook trout.	Severely degraded (sedimentation). Protect habitat from urban impacts.
2GA-2	Alder Creek	New Dundee to Nith River	Resident brook trout	Severely degraded (sedimentation, temperature). Investigate for rehabilitation potential. Consider brown trout introduction.
	Bamberg Creek	Headwaters	Resident brook trout	Protect existing habitat in headwaters.
	Cedar Creek	All	Resident brook trout	Protect existing habitat. Some rehabilitation would increase production. Restricted public access.

Appendix I: SPORT FISHERIES MANAGEMENT DESIGNATION FOR COLDWATER STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2GA-2	Hunsberger Creek	Above Huron Road	Resident brook and brown trout	Degraded (sedimentation, temperature). Protect habitat from further impacts.
	Washington Creek	Headwaters	Resident brook trout	Protect existing habitat in headwaters.
2GA-3	Mill Creek	Above Shades Mills Reservoir	Resident brook and brown trout	Habitat rehabilitation required (bank stabilization, pond modification, in stream structures). Protect habitat from development impacts.
2GA-4	Speed River	Main stream above Speedside	Resident brook trout	Degraded (high temperatures). Dam modifications required. Consider brown trout introduction.
	Speed River	Guelph Dam to Victoria Road	Smallmouth Bass	Bottom draw discharge from Guelph Lake may make temperature mo suitable for trout than bass. Investigate to determine management potential.
	Lutteral Creek	Above Eramosa Con. 6	Resident brook trout	Investigate for management potential. Degraded (high temperatures).
	Hanlon Creek	All	Resident brook and brown trout	Pond modifications required to reduce summer temperatures.
2GA-5	Eramosa River	Above Everton	Resident brook trout	Beaver dam removal, man-made dam removal or modification and channel narrowing required to reduce summer temperatures.
	Eramosa River	Arkell to Everton	Resident brown trout	Degraded (high temperatures), dam removal/modification require
	Blue Springs Creek	All	Resident brook and brown trout	Protect existing habitat. Some rehabilitation would increase production.
2GA-6	Conestogo River	Conestogo Dam to Glen Allen	Transitional coolwater/ coldwater	Temperatures suitable for trout due to Conestogo Dam. Stock hatchery reared trout to provide immediate angling opportunities.

Appendix I: SPORT FISHERIES MANAGEMENT DESIGNATION FOR COLDWATER STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2GB-1	Mount Pleasant Creek	Above Burtch	Resident brook trout	Investigate for management potential. Trout may no longer be present. Consider brown trout introduction.
2GB-4	Blue Lake Creek	Above Highway 24	Resident brown trout	Conduct aquatic habitat inventory. Protect existing habitat.
2GB-5	Whitemans Creek	Bishop Gate Road to mouth	Resident brown trout	Protect existing habitat. Some enhancement of main stream and spring fed tributaries would increase production. Implement a catch-and-release angling zone. Consider erecting a barrier at mouth to restrict migratory salmonids.
	Horner Creek (upper Whitemans)	Highway 401 to Highway 2	Resident brown trout	Cattle fencing and erosion control required to reduce temperatures and sedimentation and enhance lower stream.
	Landons Creek	Bishops Gate Road to mouth	Resident brown trout	Habitat enhancement would increase production.
2HB-2	West Credit River	All in district boundaries	Resident brook trout	Dam removal or modification required to reduce temperatures. channel rehabilitation and erosion control required to reduce silting.
	Black Creek	Above Niagara Escarpment	Resident brook trout	Protect exist habitat. Prevent nutrient overloading.
	Black Creek	Limehouse to mouth	Resident brook trout, migratory rainbow and brown trout, pacific salmon	Protect existing habitat and groundwater discharge. Rehabilitation required to reduce summer temperatures. Consid dam modification to allow Atlantic salmon access.
	Silver Creek	All	Resident brook trout, migratory salmonids in lower reaches	Habitat rehabilitation required to reduce siltation and summer temperatures. Protect existing habitat from residential development.

Appendix I: SPORT FISHERIES MANAGEMENT DESIGNATION FOR COLDWATER STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2HB-3	Oakville Creek (Milton Branch)	Above Kelso Reservoir	Resident brook and brown trout	Investigate to determine management potential. Rehabilitation (dam modification/removal) required to reduce summer temperatures.
	Oakville Creek	Kelso Reservoir to Derry Road	Resident brown trout, migratory rainbow trout	Investigate to determine management potential.
2HB-4	Bronte Creek	Above Dam in Flamboro	Resident brook trout	Protect existing habitat. Study summer temperature patterns.
	Bronte Creek	Flamboro to Lowville Dam	Resident brook trout	Protect existing habitat from residential development. Study temperature patterns. Maintain Lowville Dam as a barrier to salmonid migration.
	Bronte Creek	Below Lowville Dam	Transitional warmwater/ coldwater migratory rainbow and brown trout, Pacific salmon, smallmouth bass	Conduct population assessment to determine trout reproductive potential. Modify existing angling regulations to increase recreation potential and protect vulnerable spawning salmonids.
2HB-4	Killbride Tributary	All	Resident brook and brown trout	Protect existing habitat from residential development.
	Limestone Creek	Above Niagara Escarpment (Guelph Line)	Resident brook trout	Protect existing habitat. Dam removal/modification required to reduce summer temperatures.
	Limestone Creek	Escarpment to mouth	Resident brook trout, migratory rainbow and brown trout, Pacific salmon	Further rehabilitation (erosion control, in stream debris removal) required to reduce siltation and summer temperatures.

Appendix I: SPORT FISHERIES MANAGEMENT DESIGNATION FOR COLDWATER STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2HB-5	Grindstone Creek	Above Escarpment (Waterdown)	Resident brook trout	Investigate to determine management potential. Trout population may no longer be present.
	Grindstone Creek	Below Escarpment	Migratory rainbow trout	Protect existing habitat. Investigate regulation changes (fish sanctuary) to protect trout during spawning period.
2HB-6	Spencer Creek	Above Westover Road	Resident brook and brown trout	Rehabilitation required to reduce summer temperatures and improve spawning habitat.
	Spencer Creek	Websters Falls to Cootes paradise	Smallmouth bass, migratory runs of rainbow trout, Pacific salmon	Investigate to confirm reports of successful rainbow trout reproduction and to determine management potential.
	Unnamed Tributary	Brock Road to Westover Road	Resident brook trout	Investigate to determine management potential. Trout population may no longer be present.
	Sulphur Creek	All	Resident brook trout	Investigate to determine management potential. Trout population may no lonter be present.

Appendix II: SPORT FISHERIES MANAGEMENT DESIGNATION FOR WARMWATER/COOLWATER RIVERS AND STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2FC-3	South Saugeen River	All within district boundaries (Mount Forest area).	Smallmouth bass, resident brook trout (seasonal)	Investigate to determine management potential.
2GA-1	Grand River	Above Belwood Lake	Northern pike, yellow perch	Protect existing habitat to maintain water quality downstream.
	Grand River	Belwood Dam to Inverhaugh	Transitional coolwater/coldwater - northern pike, yellow perch	Cold temperatures due to Belwood Dam discharge. May be more suitable to manage as a coldwater fishery.
	Grand River	Inverhaugh to Paris Dam	Smallmouth bass, northern pike, panfish	Protect existing habitat from agricultural and urban impacts (soil conservation, stormwater management and sediment controls). Introduce river resident walleye to areas with suitable habitat.
2GB-1	Grand River	Paris Dam to Caledonia Dam	Smallmouth bass, walleye, northern pike, migratory salmonids, (adult migration only), panfish	Protect existing habitat as above. Protect vulnerable spawning walleye. Facilitate angler access. Investigate potential to enhance walleye production. Investigate feasibility of active migratory salmonid management.
2GA-2	Nith River	Above New Hamburg Dam	Smallmouth bass, northern pike	Watershed rehabilitation (soil conservation, livestock fencing, improved manure management) required to control sediment and nutrient imputs. Provide walleye access via fishery at New Hamburg.
	Nith River	New Hamburg Dam to mouth	Smallmouth bass, northern pike, walleye, panfish	As above. Investigate potential to enhance walleye production.

Appendix II: SPORT FISHERIES MANAGEMENT DESIGNATION FOR WARMWATER/COOLWATER RIVERS AND STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2GA-4	Speed River	Guelph Lake to Speedside	Smallmouth bass	Protect existing habitat to maintain water quality downstream.
	Speed River	Guelph Dam to Victoria Road	Smallmouth bass	Bottom draw discharge from Guelph Lake may make temperatures more suitable for trout than bass. Investigate to determine management potential.
	Speed River	Victoria Road to mouth	Smallmouth bass, northern pike	Protect existing habitat from urban development impacts (stormwater management, sediment control).
2GA-5	Eramosa River	Eden Mills Dam to mouth	Smallmouth bass, northern pike, brown trout (occasional)	Protect existing habitat. Warmwater species range may move downstream as rehabilitation for coldwater species progresses.
2GA-6	Conestogo River	Above Conestogo Lake	Smallmouth bass	Habitat severely degraded. Massive watershed rehabilitation (soil conservation, livestock fencing, improved manure management) required to control sediment and nutrient inputs.
	Conestogo River	Conestogo Dam to Glen Allen	Transitional coolwater/coldwater - smallmouth bass, northern pike, yellow perch	Cold temperatures due to Conestogo Dam discharge. May be more suitable to manage as a coldwater fishery.
	Conestogo River	Glen Allen to mouth	Northern pike, smallmouth bass, panfish	Watershed rehabilitation required to control sediment and nutrient inputs. Introduce walleye.
2GB-2	McKenzie Creek	All in district boundaries	Northern pike	Investigate to determine management potential.
2GB-3	Big Creek	Highway 2 to mouth	Northern pike, walleye (near mouth)	Investigate to determine management potential.

Appendix II: SPORT FISHERIES MANAGEMENT DESIGNATION FOR WARMWATER/COOLWATER RIVERS AND STREAMS IN CAMBRIDGE DISTRICT

WATER-SHED	STREAM/RIVER	PARTITIONING	FISH COMMUNITY	COMMENTS
2GB-4	Fairchild Creek	Highway 5 to mouth	Northern pike, walleye (near mouth)	Conduct aquatic habitat inventory and population assessment to determine management potential.
2HA-2	Twenty Mile Creek	All in Binbrook Township	Unknown	Investigate to determine management potential.
2HA-7	Welland River	Below Binbrook Dam to district boundary	Northern pike, walleye	Conduct fish population assessment to determine management potential.
2HB-3	Oakville Creek	Below confluence with East Oakville Creek	Smallmouth bass, seasonal adult salmonid migrations	Protect existing habitat from urban development impacts.
	East Oakville Creek	Highway 401 to mouth	Smallmouth bass	Protect existing habitat from urban development impacts.
2HB-2	Credit River	All within district boundaries (Terra Cotta to Norval)	Transitional warmwater/coldwater - seasonal adult salmonid migrations	Coordinate management approach with Maple District. Protect habitat and manage fishways to facilitate Atlantic salmon migration.
2HB-4	Bronte Creek	Lowville Dam to mouth	Transitional warmwater/coldwater - smallmouth bass, migratrory rainbow and brown trout, Pacific salmon	Conduct fish population assessement to trout reproductive potential and warmwater sportfish management potential. Protect habitat from urban development impacts.
2HB-7	Spencer Creek	Websters Falls to Cootes Paradise	Smallmouth bass, migratory runs of rainbow trout, Pacific salmon	Investigate to determine management potential.

Appendix III: FISHERIES MANAGEMENT DESIGNATION FOR INLAND LAKES AND RESERVOIRS IN CAMBRIDGE DISTRICT

WATERSHED	WATERBODY	RESIDENT FISH COMMUNITY	COMMENTS
2GA-1	Pinehurst Lake	Largemouth bass, panfish	Inventory required to determine management potential.
	Luther Lake	Yellow perch, bullhead	Manage as a sport and baitfishing area. Work with GRCA to develop management strategy. Consider largemouth bass introduction.
	Floradale Reservoir	Unknown	Inventory required to determine management potential.
	Laurel Creek Reservoir	Bullheads, panfish species	Underproducing due to water level fluctuations (winter draw-downs). Work with GRCA to determine management potential.
	Belwood Reservoir	Northern pike, yellow perch	Conduct habitat assessment to determine potential for structural enhancement to increase production. Creel census study required to determine harvest and utilization. Work with GRCA to determine feasibility of modifying water management strategies. Consider crappie and walleye introduction.
	Bannister-Wrigley Lakes	Northern pike, bullhead, black crappie	Improved angler access (docks, wheelchair access) required.
2GA-2	Alder Lake	Northern pike, largemouth bass, panfish species	Work with GRCA and Village of New Dundee to develop management strategies.
2GA-3	Shades Mills Reservoir	Northern pike, largemouth bass, yellow perch species, panfish species	Work with GRCA to develop management strategy.
2GA-4	Guelph Lake	Smallmouth and largemouth bass, black crappie, yellow perch	Conduct habitat assessment to determine potential for structural enhancements to increase production. Work with GRCA to develop management strategy. Consider species introduction (walleye, channel catfish).
	Puslinch Lake	Walleye, northern pike, yellow perch, largemouth bass	Underproducing due to high nutrient levels (periodic fish kills). Work with other agencies to develop management strategy (OMOE inland lakes program).

Appendix III: FISHERIES MANAGEMENT DESIGNATION FOR INLAND LAKES AND RESERVOIRS IN CAMBRIDGE DISTRICT

WATERSHED	WATERBODY	RESIDENT FISH COMMUNITY	COMMENTS
2GA-4	Little Lake	Northern pike, yellow perch, largemouth bass	Inventory required to determine management potential.
2GA-6	Conestogo Reservoir	Yellow perch, bullhead	Underproducing due to water level fluctuations. Consult with GRCA to determine management potential. Consider channel catfish introduction.
	Damascus Reservoir	Largemouth bass, bullhead	Stunted gamefish population. Overcrowding due to underfishing suspected.
	Dunmark Lake	Northern Pike	Inventory required to determine management potential.
2HA-7	Binbrook Reservoir (Lake Niapenco)	Walleye, northern pike, largemouth bass, panfish species.	Inventory, fish population sampling and creel survey studies required to determine management potential. Overfishing suspected.
2HB-2	Fairy Lake	Northern pike, smallmouth bass	Inventory required to determine management potential.
2HB-3	Kelso Reservoir	Stocked rainbow trout, black crappie, brown trout	Potential for management for both warmwater and coldwater fisheries. Work with HRCA to determine management potential.
2HB-4	Mountsberg Reservoir	Largemouth bass, panfish species	Inventory, fish population sampling, creel census studies required to determine present utilization and potential for increasing production.
2HB-7	Valens Reservoir	Largemouth bass, northern pike	Same as above.
	Christie Reservoir	Largemouth bass, panfish species	Same as above.

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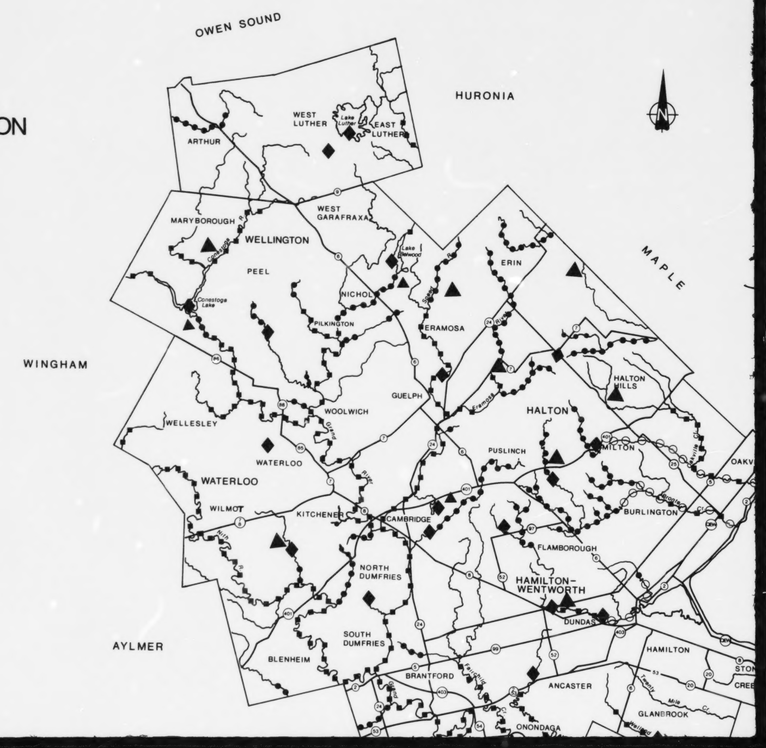
MAP 1

CAMBRIDGE DISTRICT
FISHERIES BACKGROUND INFORMATION

- Coldwater Streams
- Warmwater / Coolwater Rivers and Streams
- Migratory Salmonid Runs
- ▲ Public and Private Fishing Areas Stocked With Trout
- ◆ Warmwater / Coolwater Lakes and Reservoirs



MAP 2

CAMBRIDGE DISTRICT
FISHERIES MANAGEMENT TACTICS
1989 - 1993

SURVEYS

1. Stream Inventory
2. Lake Inventory
3. Productivity Study
4. Spawning Survey
5. Creel Census
6. Habitat Assessment
7. Temperature Study

STRUCTURAL IMPROVEMENTS

- ▽ Stream Habitat Improvement
- ▽ Lake Habitat Improvement
- ▽ Dam Modification
- ▽ Cattle Fencing
- ▽ Boat Launch
- ▽ Shoreline Angler Facilities

POPULATION MANAGEMENT

- ◇ Stock Catchable Trout
- ◇ Stock Rainbow Tr. Yearlings
- ◇ Stock Brown Tr. Yearlings
- ◇ Stock Pacific Salmon
- ◇ Stock Lake Trout
- ◇ Walleye Introduction**
- ◇ Pike Introduction**
- ◇ Channel Catfish Introduction**

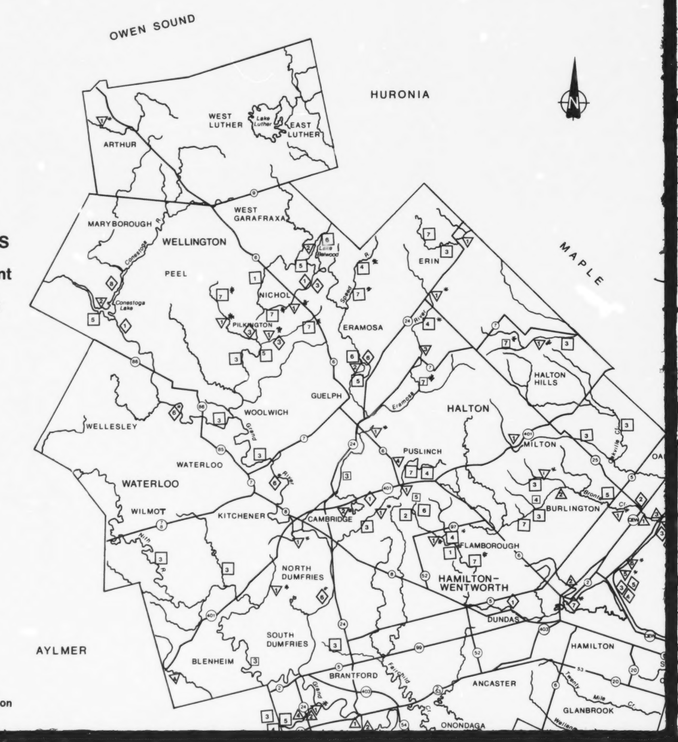
REGULATION CHANGES

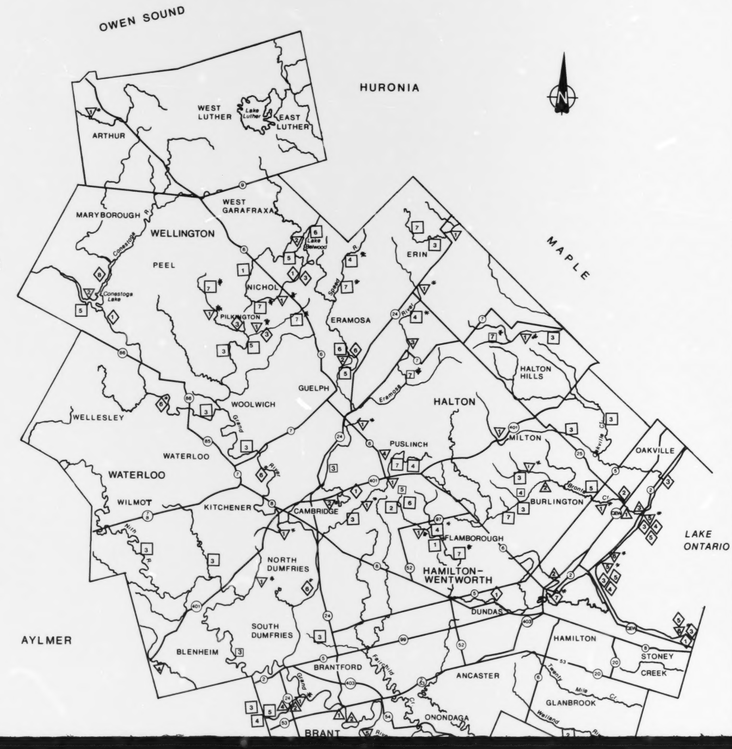
- △ Extend Trout Season**
- △ New Fish Sanctuary**
- △ Remove Fish Sanctuary**
- △ Catch and Release**

** Pending further study and public consultation

NOTE:

* after symbol indicates activity could be implemented with community or municipal assistance





MAP 2

CAMBRIDGE DISTRICT
FISHERIES MANAGEMENT TACTICS
1989 - 1993

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1. Stream Inventory
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5. Creel Census
6. Habitat Assessment
7. Temperature Study

STRUCTURAL IMPROVEMENTS

- ▽ Stream Habitat Improvement
- ▽ Lake Habitat Improvement
- ▽ Dam Modification
- ▽ Cattle Fencing
- ▽ Boat Launch
- ▽ Shoreline Angler Facilities

POPULATION MANAGEMENT

- ◇ Stock Catchable Trout
- ◇ Stock Rainbow Tr. Yearlings
- ◇ Stock Brown Tr. Yearlings
- ◇ Stock Pacific Salmon
- ◇ Stock Lake Trout
- ◇ Walleye Introduction**
- ◇ Pike Introduction**
- ◇ Channel Catfish Introduction**

REGULATION CHANGES

- △ Extend Trout Season**
- △ New Fish Sanctuary**
- △ Remove Fish Sanctuary**
- △ Catch and Release**

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